CHEMICAL MARKETS

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of Chemistry and Industry

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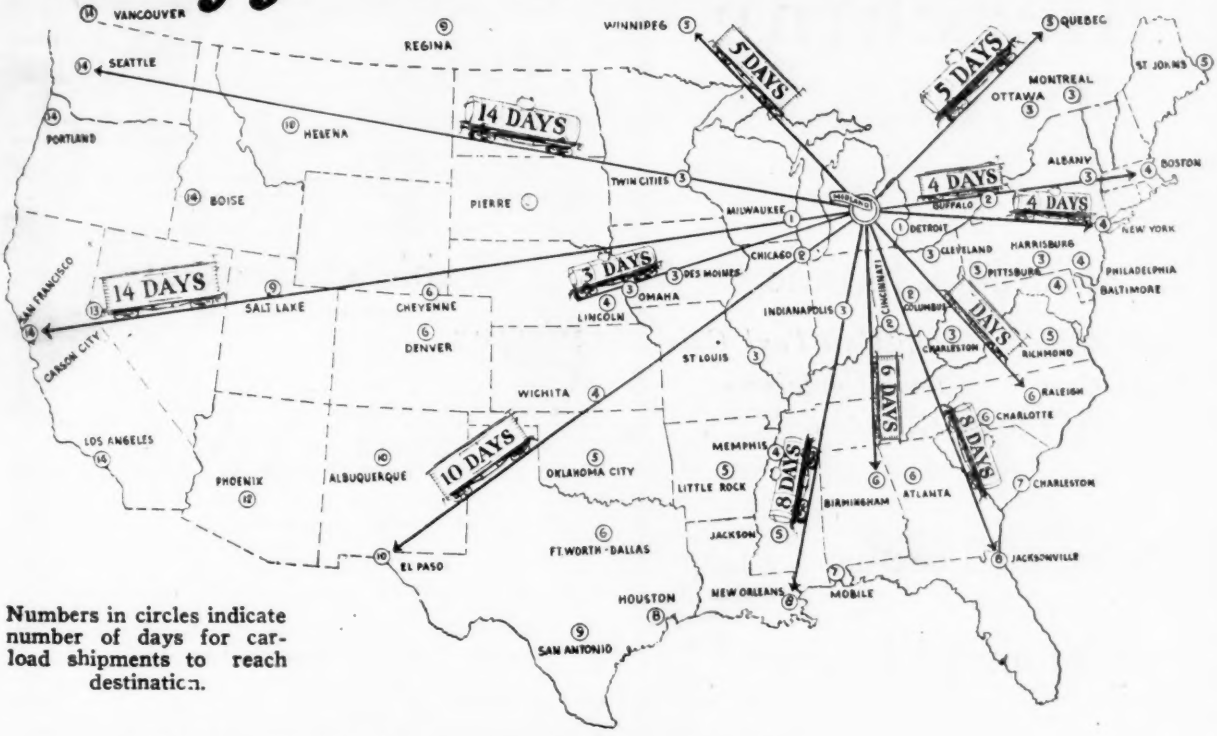

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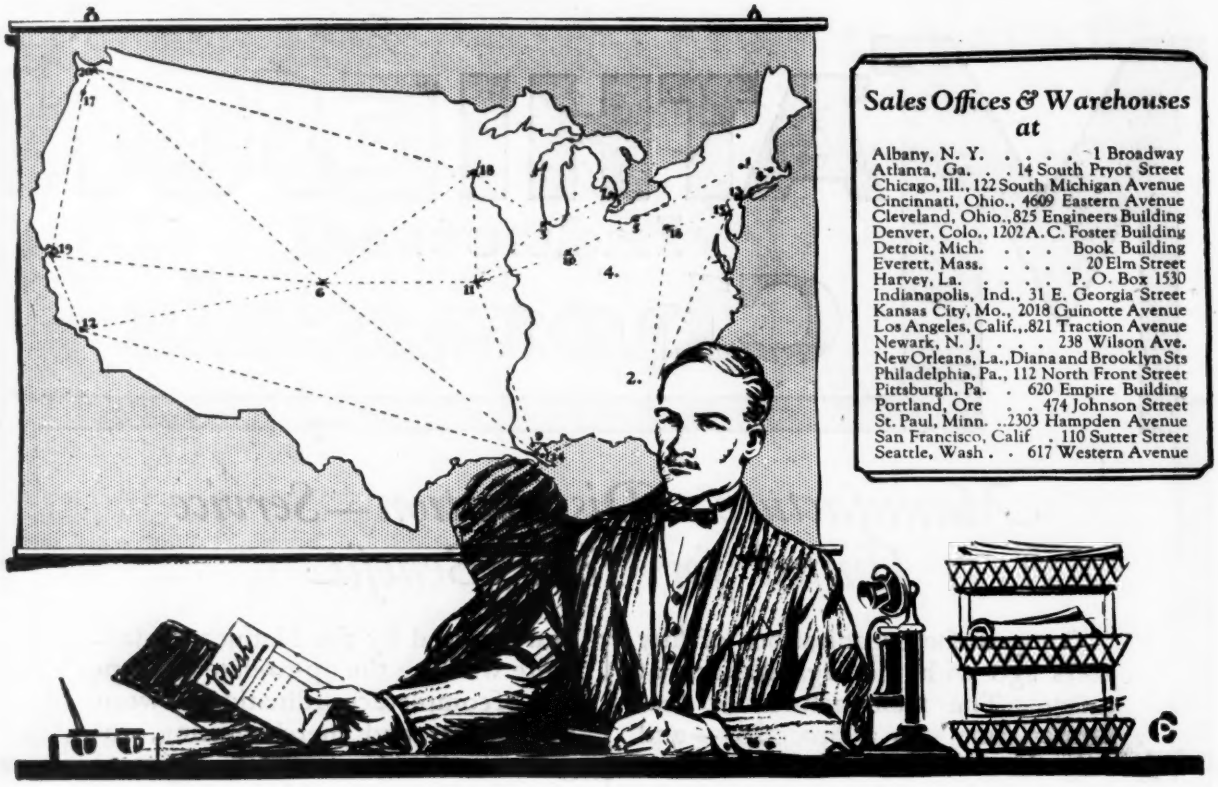

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CHEMICAL MARKETS

VOL. XX NEW YORK, MAY 12, 1927 NO. 19

Chemical Combinations

STUDY of that mysterious monograph on the world's chemical industries, prepared by the German chemical industry and annotated by the industrial associations of England, France, Italy, and other members of the League of Nations, reveals that the Geneva Economic Conference is to be used in a drive against high tariffs. Elsewhere we print the significant features of the German report together with some British comments. Obviously the Germans plan to make the most of their recent advances in chemical technique by securing the backing of the League for the idea that chemicals are a universal raw material of industry, and that as such, every effort should be made to denationalize chemical manufacturing in order that the world may draw its supplies from those localities best fitted by raw materials, by power, and by technical skill to supply the universal demand.

PRETTY obviously, the British do not fall whole-heartedly in with this plan, and while the French are prepared to support efforts to reduce competition by combination within their own borders, they are not willing to give up a well-rounded chemical industry which they feel essential to their national development and defense. The Poles go even further and point out what appears to us a novel argument for high tariff in the high cost of capital—from 10 to 15 per cent.—which is not offset, they feel, by low wages or abundant power.

THE Germans may not succeed in this move directly or at this time; very possibly, they have no hope of doing so. But they are obviously building up a sentiment in the various nations for the establishment within national boundaries of big chemical trusts, hopeful that these national chemical giants can enter into trade treaties which will accomplish their same purpose. Either directly or indirectly, such a plan is distinctly a menace to American chemical industries.

THE danger lies not in our chemical weakness. We have the skill, the capital, and the greatest storehouse of chemical raw materials. But our Government forbids American chemical manufacturers to enter into these cartels and trusts. The law of our land distinctly forbids price agreements and allocation of markets within our own territory. And so although the United States is the greatest chemical consumer in the world today, our chemical manufacturers are threatened by concentrated powerful competition in foreign markets and even within our own territory unless adequately protected by tariff. This one point—the ban preventing American manufacturers from combining—must be made crystal clear to the American people and to Congress.

CHOOSING A SOLVENT

In no group of chemical products has the whirlwind advance of the past few years been so significant as among the solvents. Not only have many new solvents come to the fore commercially, but new solvent uses have been developed in many different industrial fields. As a natural result, the competition between different solvents for various uses is becoming increasingly keen. There is a definite tendency to study carefully the peculiar properties of solvents in an effort to determine that one which is best for any especial use.

A commercial factor of considerable importance in this new solvent situation is the source of raw materials for manufacturing as they determine to a great extent the quantities that will be available and the price that will be profitable because large industrial uses may not be built up for a solvent of restricted output. The rapid expansion of the lacquer industry is due not a little to the fact that fusel oil has been replaced by butanol which is available in unlimited quantities.

On the other hand, new chemical uses in other fields are having their effect on solvent prices. As an example, benzol would long ago have sold at a lower price had it not been for its extended use as an anti-knock fuel for internal combustion engines. The larger production of other satisfactory anti-knock fuels from other products will surely in time release benzol—a supply which is also effected by the forced recovery of toluene to supply lacquer makers' requirements.

The raw materials of solvents are accordingly of increasing significance, and it is noteworthy that the principal raw materials are growing crops, petroleum, coal, and chlorine. Butanol from corn and methanol from hard wood may, if recent chemical developments keep their early promises, be soon subjected to competition by synthetic sources of supply. Many secondary and tertiary alcohols will undoubtedly be developed from petroleum and coal—the latter (due to the extensive market already existing for petroleum products) probably offering at the present time the most likely field for the development of new solvents on a commercial scale.

In this issue experts have reviewed the principal solvents from the principal sources—a timely survey of the field which is assuredly deserving of the careful study of any manufacturer planning the production of any product requiring considerable quantities of solvents. If he selects as a solvent one from a raw material that will respond to expansion on his part only by a sharply higher price or a natural shortage, the attractiveness of his manufacturing intention may entirely disappear. Fortunately there are available now such a wide variety of solvents that not only may these commercial considerations be properly solved, but also the chemical problems of the best material for a given use find adequate answers.

This week establishes a new world's record in chemical consolidations—from London comes confirmation of the Imperial Chemical Industries, Ltd. and the I. G. Farbenindustrie Aktiengesellschaft merger; the big French combination is announced in Paris, and the Merck-Powers-Weightman-Rosengarten merger is formed in our midst and London gossips are harvesting a hasty crop of rumors. Paris is jubilant and New York and Philadelphia hum with compliments and congratulations.

[Ten Years Ago]

(From Drug & Chemical Markets, May 9, 1917)

John F. Queeny, president of Monsanto Chemical Works, returned to St. Louis from his trip to Australia last week and was given a rousing reception by his business associates at the home of the Missouri Athletic Association.

Semet-Solvay Co. has closed a contract with Government for approximately $400,000 worth of ammonium picrate. The company has been producing picric acid in enormous quantities since the start of the war.

Marden, Orth & Hastings has opened a new branch office in Hoge Building, Seattle.

Copper sulfate is in heavy demand for export. The quotation for large crystals on spot holds at 9½c@9¾c lb.

Caustic potash presents an easier tone. Offers are abundant and consumers have not entered the market heavily. Small business has passed at 65c@68c lb. for 70-75 per cent at works.

The New York market for toluene is brisk. Demand is heavy especially from the Government. Spot is quoted at $2.00 gallon and contracts at $1.80, with higher prices predicted within a week.

Toluidines are in heavy demand and the tone of the market is strong. Mixed are selling 85c@90c lb., para at $1.90@$2.10, and ortho at $1.25@$1.35.

E. C. Klipstein & Sons Co., of New York, have prepared plans to erect an addition of fine new concrete buildings at South Charleston, W. Va.

The opening of the chemical exposition is set for September 24. The list of exhibitors thus far includes 90 per cent of those who exhibited last year, and all the available space on the first and second floors has been taken as well as part of the space on the third floor.

[Foreign Trade Opportunities]

Cosmetics	24387	Berlin, Germany	Purchase
Drugs, pharmaceutical and toilet preparations, serums, vac ines	24386	Barcelona, Spain	Agency
Medical and pharmaceutical specialties	24355	Berlin, Germany	Purchase
Medical and toilet preparations.	24390	Mexico City, Mexico	Purchase
Toilet preparations	24359	Prague, Czechoslovakia	Agency
Toilet preparations, perfumery.	24389	Vienna, Austria	Agency

Chemicals as Analysed at Geneva

Significant Abstracts from the official monograph on the Chemical Industry prepared by Dr. C. Ungewitter of the German Chemical Manufacturers Association for consideration at the Geneva Economic Conference, together with the most telling comments on this much discussed German paper from the British Chemical Industry.

THE present monograph is intended to serve as a basis for the study of the "situation of the industry and the causes of its difficulties", written in reply to the request of Commission B of the Preparatory Committee for the International Economic Conference of the League of Nations to deal with the branch of industry concerned with "chemical products (especially potash)". The monograph should therefore set out the special features of the international situation of the "chemical industry".

General Survey.

The general situation (the conditions of its development will be examined below in detail) is as follows: In 1913, chemical products to the value of 10 milliards of gold marks were produced in the whole world, as against a production valued at 18 milliards of gold marks in 1924. Allowing for the depreciation in the value of gold, the total production therefore has risen by 35 to 40 per cent.

The total foreign trade in chemical products amounted on the basis of the export figures alone to 3.2 milliards of gold marks in 1913 and to 4 milliards of gold marks in 1925. This rise in value approximately corresponds to the depreciation of gold; the total volume of exports has thus remained unchanged.

The chief exporting countries in 1913 were as follows:

	Per cent.
Germany	28
Great Britain	16
Chile	15
United States of America	10
France	10

In 1925, this order had changed as follows:

Germany	23
United States of America	16
Great Britain	14
France	13
Chile	11

Technical Development.

Originally, the technical processes of the chemical industry, as of all other branches of industry, rested on a purely empirical basis. But in few branches of industry has technique been so revolutionized by modern science as in the chemical industry.

Two striking examples of the extent to which the development of the chemical industry is influenced by these highly developed scientific methods of work may be quoted: first, the industry of organic chemical products—aniline dyes, pharmaceutical preparations and synthetic perfumes; and second, the manufacture of synthetic nitrogen compounds, particularly for fertilizing purposes. The former branch of production could not have developed had it not been for the brilliant achievement of organic chemistry, or the latter without the help of physical chemistry.

The future development of the chemical industry largely depends on how far it proves possible to maintain and develop this scientific character of chemical technique. This again depends upon the progress of chemistry and the other natural sciences, which in their turn depend upon the development of institutions for scientific research and of scientific teaching.

The promotion of scientific research and scientific teaching is an important duty of the public authorities, and both have developed and will continue to develop in proportion to the importance attached to them by those authorities and the extent to which these are able to provide funds for the purpose out of the public revenue. According to Garvan, for example, the United States, in 1920 to 1924, spent the equivalent of over 420 million gold marks on the equipment of chemical institutes in the universities, and propose to spend another 2,100 million gold marks on such institutes in the next ten years. These figures do not include expenditure on teaching.

On the other hand, these special technical methods involve heavy capital charges on chemical enterprises, a burden which can only be supported if it is spread over a long period, and if the enterprises are not compelled to realise quick profits. Furthermore, even if the methods proved successful, the undertakings must be able to count on a corresponding turnover, as otherwise the overhead costs would show an unsound relation to the current costs of production (expenditure on raw materials, power and wages).

Indeed, private enterprises must themselves supplement the work done by public bodies by scientific research work of their own. They must attach to their works extensive scientific laboratories in which systematic researches must be conducted on a scientific plan in the special and allied branches of which their production is concentrated. If a new product or process is discovered in this way, much scientific and technical skill must be expended and considerable capital must be invested in experimental apparatus for a considerable period before practical factory operation is begun.

A well-known example is provided by the discovery of synthetic indigo.

Moreover, the manufacturing processes themselves must be scientifically controlled in all their various stages. In no branch of industry is the proportion of scientifically trained chemists and engineers to the other workers so great as in the chemical industry. This constitutes an additional financial burden on chemical production.

But it is not enough to discover new chemical products—new dyes, new drugs or new compounds suitable for fertilisers—to find technical methods for their preparation and

to supervise their progress scientifically. The best methods of applying the products must also be scientifically investigated and technically developed by the producing firm. For example, before the new aniline dyes could be introduced into the textile industry, the dye-factories had to establish extensive laboratories which assumed almost factory proportions and entailed large capital expenditure. Pharmaceutical factories have to spend large sums on the clinical testing of new medicines before they can be placed on the market. The chemical-fertiliser industry must study carefully the effect of their new nitrogen and phosphorous compounds on large experimental farms and work out the various methods of applying these fertilisers before their products can be placed on the agricultural market.

The capital expenditure required by activity of this special kind can only be met if the producers in question can reckon on a corresponding return in case of success.

A typical example is the development of the aniline-dye industry. This industry came into existence at the end of the fifties and at the beginning of the sixties of the nineteenth century almost simultaneously in Great Britain, France and Germany. Although several countries had a share in the earlier stages, the leadership soon passed into the hands of Germany. This country brought the aniline-dye industry to the rank of a large-scale industry and supplied 88 per cent of the world consumption before the war.

The Dye Industry.

This concentration in a single country was of decisive importance for the development of this industry into a remunerative large-scale industry. Only the custom of the entire world market or of a very large proportion of it could guarantee the aniline dyes industry sufficient return to render technical work on the scale described above an economic possibility. The total world sales of aniline dyes as shown by the figures given below in Section 2 could hardly have exceeded 160 thousand tons annually before the war, valued at 350 million gold marks. This quantity is divided among 1,500 dyes, if we count only the chemical "individuals" and ignore the fact that many of them are brought on to the market in varying degrees of concentration and in various mixtures. Nor does this figure include those dyes which, although they have been scientifically discovered, are not effectively produced. The number of dyes which are produced on a large scale, such as sulphur black and indigo, is comparatively small. These dyes have borne the brunt of the expenses, and have materially reduced the total amount of general costs to be distributed among the separate dyes. Their production first placed the industry in a position to develop the whole range of 1,500 colours, so that, for each individual application and for each degree of fastness and colour effect desired, the manufacturer has a specially adapted dye-stuff at his disposal. But the market for the great majority of these dyes, even taking world consumption as a whole, was very small, since the total sale of all aniline dyes, including those manufactured on the largest scale, only amounted to 160 thousand tons a year.

While, therefore, before the war, the dominant characteristic of the aniline-dye industry was its concentration in a single country, the process since the war has been reversed. In nearly all the great consuming countries, in proportion as they are industrially active, there has been a tendency to develop a native aniline dye industry. Industries on a considerable scale have arisen in the United States, Great Britain, France, Italy and Japan. The aniline dye industry of Switzerland, which already existed before the war, has remained on approximately the same footing. The German share of the total production has fallen to 46 per cent.

As already stated above, the world's requirements in aniline dyes have not risen, but have remained at about the same level as before the war. The possible world turnover has therefore remained unchanged, despite the numerous old and new industries in existence. The possible turnover of each individual industry can therefore be only a fraction of the German industry alone before the war. The consequence is that there is now in each of these industries a thoroughly unsound ratio between overhead costs and current costs of production (expenditure on raw materials, power and wages). Consequently, in none of the new producing countries have the younger industries been able to develop and maintain themselves out of their own resources. Not only has it been necessary in many countries to spend public money on their maintenance, but the domestic market has had to be protected by high Customs barriers, and in some cases import prohibitions have been required to regulate and restrict artificially the influx of foreign dye-stuffs.

Supply of Raw Materials.

Of course, the development of the chemical industry, like that of all other industries, depends on the supply of raw materials available. A characteristic of the chemical industry is that, as a rule, it employs raw materials of comparatively small value, available in abundance and obtainable everywhere, for the preparation of synthetic products which then replace in other branches of production materials of natural origin the supply of which is limited. For example, the natural supply of nitrogen compounds in the form of Chile saltpetre is strictly limited. The chemical industry has, however, succeeded in producing artificial nitrogen compounds in the form of ammonia or calcium cynamide, which as raw materials only require atmospheric nitrogen and water or coal and lime, and as sources of energy coal or water power, all these materials and sources of power being much more abundant than Chile saltpetre.

The characteristic feature of chemical production is, therefore, that it is gradually making the human economic system independent of the natural distribution of the supply of raw materials. This independence is of course only relative. The supply of raw materials imposes certain limits on the industry. The inorganic chemical industry, for example, depends on the supply of cheap power and on that of salt, lime and suitable transport facilities for pyrites or uncombined sulphur. For establishments for making synthetic nitrogen cheap power is a pre-requisite. The most favourably placed country in this respect is the United States, which has nearly all the raw materials required for chemical production in her own territory. As regards the three chief European producing countries, Germany is particularly short of phosphates, and her requirements in pyrites are only partly met by home production. Great Britain has also no phosphates and no sulphur or pyrites. France has at her disposal enormous phosphate deposits in her North African possessions, but has difficulties with regard to her coal supply and has to import pyrites.

The greater the value of a chemical product in proportion to its weight, the more independent is the branch of industry which produces it of the source of raw material. A typical example is provided by the existence of a very remunerative aniline-dye industry in Switzerland, although that country has no coke industry from which to draw its materials.

Some of the most important materials for the chemical industry are specially dealt with below in Section 7.

Non-Economic Factors.

The factors hitherto described as determining the development of the chemical industry may, from the point of view of present trade conditions and of the world market, be termed "economic factors". Side by side with these factors we must consider another group, that of "non-economic factors". In the last twelve years, these factors have had a great influence on the development of the

chemical industry. They chiefly take the form of intervention by national Administrations in economic affairs by means of Customs duties, import prohibitions, subsidies, etc., and also by the conclusion of commercial treaties and other international agreements.

Such intervention may be exercised in two directions, according to the two fundamental tendencies which may be noted in the development of every national economy. Each of these tendencies acts in a contrary direction, as do the Governmental measures which they determine.

On the one hand, there is the ambition to develop as far as possible all the various branches of industry within the national economic system, so as to bring the country to a state of relative independence and self-sufficiency, without in many cases examining whether or not the special circumstances of the case indicate that course.

On the other hand, we have the tendency to organise the national economy so that it should fulfill its task with the smallest possible expenditure of energy. This involves, however, according to circumstances, a greater or less adaptation to foreign trade, *i.e.* to export and import. Preference is given to the production of those goods for which the circumstances of the country are most favourable, and the surplus of production not consumed within the country is exchanged for the goods which are produced under more favourable circumstances in other countries. The attempt to produce such goods at home is therefore abandoned in a greater or lesser degree. This process leads to the natural specialisation of production known as the "international division of labour".

We cannot in the present monograph go into the pros and cons of these two tendencies. We shall confine ourselves to noting that, since the war, the tendency to ensure the greatest possible independence of the national economic system and to shut it off, to a greater or lesser extent, from the world economic system has gained the upper hand in many countries. These countries endeavour to create extensive chemical industries of their own or to supplement and extend existing branches of chemical production, regardless whether the prerequisite conditions exist in the country and whether it would not be more advantageous to buy the chemical products in question from these countries in which the conditions of manufacture are more favourable.

As the new or enlarged chemical industries cannot subsist on their own resources, the State assists them by means of Customs tariffs, import prohibitions and even money subsidies. A statistical survey of these administrative measures in the domain of the chemical industry will be found below, which, in accordance with the plan followed in this monograph, deals with Customs tariffs, etc.

If we compare, as is done below the total world production of chemical products with the total exports or imports of all countries, we shall find that there has in fact been a considerable dislocation, for, while in 1913 32 per cent of the production was exported, in 1924 it was only possible to export 23 per cent. On the average, imports have therefore fallen, and home requirements have been increasingly met by home production.

With regard to the second tendency, the increased interrelation between the national economy and world commerce, we find another group of Government measures, of which the most important are commercial treaties. Unlike Customs tariffs and import prohibitions, these are intended to promote international trade. They are often accompanied by tariff agreements which either limit certain duties so that they cannot be further increased, or lower specific duties so that the general tariff level is correspondingly reduced. The influence of these tariff agreements, however, has not as yet made itself felt to any considerable extent in the sphere of the chemical industry.

The Chemical Industry as a Whole.

It is hardly possible to obtain accurate figures of the total chemical production of the world. The majority of countries do not publish official statistics regarding this production and it is only possible to obtain figures for a very small number of products from private sources. Official production statistics are only available for the United States, Canada, Sweden, Australia and to a limited extent for Norway and Denmark. For the rest we are obliged to rely on estimates.

To this difficulty in obtaining data must be added another fundamental and practical difficulty. Even if it were possible to collect data regarding all the products of the chemical industry, a simple addition of those data would lead to erroneous conclusions. A quantitative total is impracticable. It is not possible, for example, to add together the quantities of sulphuric acid and of pharmaceutical products manufactured if it is desired to obtain a figure from which any economic conclusions can be drawn, since the value per quantitative unit of sulphuric acid and of pharmaceutical products is too different. And even if we add the values of the substances produced, difficulties arise. The various branches of chemical production are not horizontal, *i.e.*, on the same stage of production, but, as already indicated above, are inextricably mingled at every stage from the raw material to the finished product. The products of one branch serve as principal or subsidiary material for other branches. If, therefore, we add together the values of the different products, many values may be counted two or three times over.

If we recognize this difficulty, and are not afraid of rough estimates, we may perhaps accept the following figures for the total chemical production of the world:

	1913 or 1914 Value in milliards of gold marks	%	1923 or 1924 Value in milliards of gold marks	%
United States	3.4	34	8.4	47
Germany	2.4	24	3.0	17
Canada			0.4	2
Sweden	4.2	42	0.2	1
Other countries			6.0	33
Total	10.0	100	18.0	100

The total production of the chemical industry of the world can therefore be estimated at about 10 *milliards of gold marks annually just before the war, and at* 18 *milliards of gold marks in the years* 1923 *and* 1924 *respectively.*

The greatest share in this production is that of the United States of America which before the war was 34 per cent and in 1923 47 per cent of the whole.

The German share before the war was 24 per cent and fell to 17 per cent in 1923.

The country with the third largest chemical production is probably Great Britain, and that with the fourth greatest production is France. The estimation of the detailed figures of these countries should be attempted by their own experts.

Naturally, no guarantee can be given of the accuracy of the above estimates. They have only been attempted in order to make a beginning with the compilation of statistics on this subject.

Customs Duties.

Extensive legislation exists in many countries with regard to Customs tariffs affecting the importation of chemical products. In the various tariffs the number of specific

duties on chemical products is disproportionately large.

Thus the German tariff contains 178 such rates; the French 563; the Italian 330; the Spanish 203.

These figures only include actual Customs duties and not incidental references to chemical products which are duty-free.

An enumeration of all these individual Customs tariffs in the present monograph would be impossible. Such an enumeration would only be an accumulation of innumerable details, which, as they stood, would not be comparable with one another. Moreover, we should have as many different currencies to consider as there are countries with Customs tariffs. Again, some of the duties are specific and others *ad valorem*, while the units to which the specific duties apply vary enormously. Above all, the plans on which the tariffs are drawn up are so extraordinarily varied that for this reason alone the individual duties cannot be compared with one another as they stand.

The only way of obtaining a general idea of the level of the tariffs of the different countries is to employ the method of index numbers which is in general use among statisticians for comparing the level of prices in different countries and at different times. An attempt must be made to apply this method to Customs tariffs, although it must be clearly understood that its results will inevitably be incomplete and contain numerous sources of error. It may be hoped, however, that, with the assistance of experts in the different countries, this method may be materially improved.

Elements in Index Number

This index number is calculated at the outset only for the three chief categories of the chemical industry—heavy chemicals for technical purposes, fertilisers and aniline dyes, the latter representing the most important branch of organic chemical production.

In each of these categories we have selected a number of typical products. These are, for the group of heavy chemicals: aluminium sulphate, caustic soda, borax, calcium carbide, bleaching powder, potassium nitrate, potassium bichromate, potassium chlorate, copper sulphate, sodium sulphate, sulphuric acid, soda ash, white lead, lithopon, ultramarine, oxalic acid.

For the group of nitrogenous fertilisers: ammonium sulphate and cyanamide of calcium.

For the group of aniline dyes: 20 per cent indigo, direct deep black dry (Schuttz No. 462) and sulphur black dry, i.e. one vat dye, one azo dye and one sulphur dye.

The arithmetic mean of the final figures of the three categories was then calculated, and this was taken as an index for judging the mean tariff rates in the different countries. By this method, weighting may be said to have taken place, at least to the extent that the categories as a whole are represented on an equal footing in the final figures, so that their comparative importance is approximately represented.

The final figures are naturally of no absolute significance. Perhaps, however, they give a sufficiently accurate idea of the *comparative* tariff level of the different countries concerned in the domain of chemical production.

The net results are shown in the following table. The figures for the individual products and groups are attached to the present monograph as an annex.

This table contains no figures for Great Britain. That country has decreed a general import prohibition on aniline dyes and by-products. Duties are imposed on fine chemicals, artificial silk, films, certain ferro-alloys and a number of chemicals used in industry, such as oxalic acid, glacial acetate acid, methanol, etc. Apart from these, Great Britain imposes no duties.

Comparison of Tariffrates.

	Maximum Ad Valorem equivalents %	Min.	Maximum Ad Valorem equivalents %	Min.
Germany	5	4.5	3.7	2.8
Netherlands	0	0	0	0
Belgium	11.5	1	0	0
France	80.9	19.3	45.1	24.6
Switzerland	6.4	6.4	3.4	1.9
Austria	10.9	7.7	16.8	13.1
Poland	112.6	112.4	141.6	123.6
Czechoslovakia	33.4	28.2	16.8	13.1
Russia	137.1	137.1	141.6	123.6
Finland	8.3	8.3	27.7	27.7
Sweden	4.5	4.5	6.4	6.4
Norway	1.8	1.8	18.8	2
Denmark	2.5	2.5	3	3
Spain	158.3	64.3	48.4	30.8
Italy	36.6	28.7	5.8	4.9
Hungary	9.5	8.6	16.8	13.1
Roumania	6.9	6.9	8.4	6.1
Kingdom of the Serbs, Croats & Slovenes	65.5	50.3	24.6	19.5
Bulgaria	57.4	57.4	20.7	15.2
Greece	65.7	45.8	67.5	21.6
Canada	3.1	2.9	4.2	3.7
United States	40	40	10.5	10.5
Mexico	20.6	20.6	35.8	35.8
Argentine	70.3	70.3	52.5	52.5
Brazil	84.9	84.9	77.8	77.8
Chile	87.1	87.1	23.5	23.5
Japan	50.6	50.6	10.8	10.8
China	7	7	9.8	9.8
Dutch Indies	4	4	4.3	4.3
British India	20.6	20.6	3.9	3.9
Australia	28.2	21.6	2.7	0.7
British South Africa	7.3	6.7	8.1	8.1

We can leave out of consideration those import prohibitions which are imposed in nearly every country for fiscal reasons or considerations of public safety (security police, health police, etc.). Examples are the prohibitions imposed on matches, explosives, sweetening substances, etc. To this category also belongs the prohibition imposed on certain narcotics in virtue of international conventions.

In an intermediate category between these import prohibitions or police restrictions and restrictions of an economic character, numerous countries have regulations with regard to the importation of pharmaceutical specialties which, although they are chiefly based on considerations of public health, are materially influenced in their application by economic considerations. Thus, Section 7 of the preliminary draft of the Czechoslovak decree on specialties lays down that permission to import pharmaceutical specialties may be refused on economic grounds.

Among import prohibitions and special import regulations of a purely economic character must be distinguished those based mainly on exchange considerations, those based mainly on commercial considerations, and those based mainly on protectionist considerations.

To the first category belong the import prohibitions imposed in various countries, *e.g.*, in Italy and Poland, on luxuries. As regards chemicals, these prohibitions affect perfumery and cosmetics.

A mainly commercial character must be attributed to those import prohibitions which were decreed in different countries after the war in order to facilitate the transition from war to peace conditions, and which have been main-

(Continued on page 7)

Coal Tar Solvents

By John Morris Weiss

COAL tar solvents are mainly derived from two sources. One is the light oil obtained as a first fraction in the distillation of coal tar. Originally, in the early days of the coal tar industry, this was the only source of these materials. To-day, however, the tonnage of these materials from the coal tar light oil is relatively small in comparison with that derived from coke oven gas light oil, scrubbed from the gas issuing from the carbonization of coal in by-product ovens. Whereas on the average less than a quarter of a gallon of light oil suitable for solvent manufacture is obtained per ton of coal in the distillation of the tar, from two to three gallons per ton are recovered by scrubbing the gas. There is also some light oil recovered from carburetted water gas tar and from gas works drip oils but these amounts are relatively insignificant.

Regardless of the source of the raw material, the various coal tar solvents are worked up by fractional distillation and chemical treatment and reach the consumer as one or another of the following main grades, arranged in general in order of their boiling point and volatility; Pure benzol (benzine), 90% benzol, 50% benzol, commercial toluol, pure toluol, pure xylol, commercial xylol or solvent naphtha, hiflash naphtha. Within each grade there are in some cases distinct sub-grades, depending on the class of use to which the material is to be put but a discussion of these strictly technical points lies somewhat outside of the scope of this paper.

Up until about 1912 the use of coal tar solvents in industry grew rather slowly, the main uses being in the paint, varnish, rubber cement, and imitation leather industries. A small amount of pure benzol and pure toluol was also used in the manufacture of organic chemicals such as aniline and toluidine. At this time the total production and sale of coal tar solvents was only in the neighborhood of 2,000,000 gallons per year, the use in the different industries being distributed about as follows: paint and varnish 47%, rubber cements 18%, imitation leather 10%, Chemical manufacturer 11%, miscellaneous 14%.

The practice of scrubbing coke oven gas for its light oil content was expedited in 1914 and following years, by the tremendous war-time demand for pure benzol and pure toluol to be used as a base of military explosives, so that to-day there is an actual production in round figures of 125,000,000 gallons per year of the total tar solvents. Naturally enough the ordinary peace-time uses of these solvents could not absorb the large increase in available material. For this reason an outlet for the excess material had to be found and this was accomplished in the motor fuel field. Gasoline-benzol blends have been used as an automobile fuel and these blends have attained considerable popularity due to the increased power developed by the engine and to the fact that using a benzol blend, engine knocks due to premature explosion or detonation are substantially eliminated. The benzol blends have been sold to the public at a somewhat higher price than gasoline and hence the price for benzols in this connection have been usually at a certain differential to the tank wagon price of gasoline but also well below the price which the material would bring in the chemical or solvent field. The especial value of the benzol blends is being reduced by the production of special "anti-knock" gasolines, either by special manufacturing procedure or by admixture with certain other chemicals, the so-called "ethyl gas" being the best known example. It appears as if these developments will tend to keep benzol values in the motor fuel field very close to gasoline values.

At present something over 100,000,000 gallons of the production is used in motor fuel and only about 17,000,000, to 18,000,000 gallons per year absorbed in other channels.

In chemical manufacture the benzol is used in the production of aniline, chlor-benzol, anthraquinone and synthetic phenol. The first three chemicals are essential intermediates in the growing dyestuff industry as is also phenol, but this last substance is used in much greater amount in condensation products of the "Bakelite" type which have found such extensive uses in very diverse branches of industry. The toluol used in the chemical industry is almost exclusively in the manufacture of intermediates for dyes, medicinals and flavors. Some is still used for explosives. The chemical industry also absorbs a very small amount of the xylols.

Recent estimates place the general distribution as follows:

	Benzol	Toluol	Xylol & Solvents
Chemical manufacture, gals.	4,000,000	1,500,000	
Rubber gals.	3,000,000		
Imitation leather, gals.	500,000		
Paint and Varnish, gals.	500,000		1,000,000
Lacquers, gals.	1,500,000	3,500,000	1,000,000
Miscellaneous, gals.	1,500,000		

In the rubber, paint and varnish, imitation leather and lacquer industries, benzol was up 'til about two years ago used more widely by far than toluol, and, in fact,

of Weiss & Downs, Chemical Engineers formerly Manager of Research Department and Director of Development of the Barrett Co.

As is well known, the motor fuel market consumes 80 per cent of the benzol produced. The heavy demand for toluol for lacquers is causing producers to strip more and more of the motor benzol of of its toluol. They must at the same time strip it of the other distillates. This makes pure benzol and motor benzol identical. The benzol market is weak and toluol is strong. Mr. Weiss predicts that toluol will sell at a price two or three times the price of benzene.

was preferred due to its greater volatility. In all these uses (except paint and varnish removers) the solvent is allowed to evaporate and the workmen are necessarily exposed to the fumes to a greater or lesser extent, depending on ventilating conditions as the use became general. Many serious cases of benzol poisoning were experienced. This was not new as the first recorded case in the United States occurred around 1906, but until around 1915 cases were relatively so infrequent as to cause no general comment. About three years ago the National Safety Council appointed a committee (of which the writer was a member) to investigate the situation. The final report of this committee was published in May 1926 by the National Bureau of Casualty & Surety Underwriters, the following conclusions being reached:

"Our field studies have thus indicated that the use of benzol as an industrial solvent is attended with health hazards which can only be avoided by the provision of elaborate local exhaust ventilation and by the maintenance of a comprehensive system of medical supervision.

"On the other hand, our laboratory investigations make it clear that certain of the higher homologues of benzene, such as toluol, xylol and hiflash naphtha, are relatively free from the special hazards which attend the use of benzene itself. These substances, in large doses, are even more powerful narcotics than benzol, but their low volatility and marked odors make it highly unlikely that they will occur in workroom air in sufficient concentration to produce effects of this sort. On the other hand, they are almost wholly lacking in those specific destructive effects upon the nerve tissue, and, above all, upon the blood-forming organs so characteristic of benzol. Under ordinary conditions of use, and in any concentrations in which they would be likely to occur in workroom air, these substances appear to be relatively harmless.

"We would therefore urge that the serious attention of manufacturers now using benzol should be given to the possibility of substituting one of these or other relatively harmless substances wherever the conditions of a given manufacturing process make it possible to do so."

Coincident with this study of benzol, the use of pyroxylin lacquers started to expand tremendously and replace paints and varnishes of the old type in many fields, notably in the finishing of automobiles and furniture. In these finishes, which are basically a solution of pyroxylin in various solvents, benzol is used as a volatile thinner. Although itself unable to dissolve pyroxylin, yet a considerable proportion may be added to other pyroxylin solvents without causing precipitation, a very much greater proportion than can be used of petroleum solvents such as gasoline. With the findings of the report on the toxicity of benzol, many lacquer manufacturers turned to the use of toluol, thereby materially strengthening the toluol market since the supplies are distinctly limited. The coke ovens are tending more and more to strip the toluol from the motor benzol and at present are recovering nearly fifty per cent. of the available material. The increases in production of lacquers has absorbed all toluol produced, thereby keeping the market very firm, with the prospect of this condition continuing indefinitely. Some of the users have turned to the higher xylols and naphthas and are in part using these to eke out the supply.

In the industries using rubber cement, attempts are being made to replace benzol as a solvent. In some cases this has resulted in the use of much more expensive materials while in others, manufacturing processes have been changed so as to take advantage of the possibilities of latex, the natural aqueous rubber emulsion, which has over the last few years become an article of commerce. The problem is by no means completely solved as in certain instances no

(Continued on page 752)

Who's Who in the Chemical Industry

Howard Berkey Bishop, pres., John C. Wiarda & Co., and Sterling Products Co., Brooklyn, N. Y. Born: Bloomington, Ill., Jan. 24, 1878. Educat.: Armour Inst., 1896; Univ. of Mich., B. S., 1900. Marr.: Bertha Shaffner, Philadelphia, Sept. 22, 1909. Children: two sons, one daughter; Bus.: Analytical & research dept., General Chemical Co., 1902-17; chief chemist, Marcus Hook Wks., National Aniline & Chemical Co., 1917-19; pres., Sterling Products Co., 1908 to date; pres., John Wiarda & Co., 1921 to date. Mem.: Trustee, Chemists Club; pres., Summit, Y. M. C. A.; Masonic Lodge, Canoe Brook Country Club, Univ. of Mich., Club. Prepared scientific gravity tables adopted by Mfg. Chemists' Assn. Inventor of several processes and apparatus used in laundry and chemical industry. Hobbies: golf.

William Mueller, Eastern Sales Mgr., Commercial Solvents Corp., New York. Born; Cincinnati, Jan. 23, 1898. Educat.: Univ. of Cincinnati, Bus. Draftsman, 1920, Commercial Solvents Corp., 1922, asst. treas.-asst. secy.; 1923, asst. secy., asst. treas. & purchas. agt.; 1924 to date Eastern Sales mgr. Public Record: Private, U. S. Army; Mem.: Alpha Tau Omega Frat., Chemists' Club, N. Y. Fraternities Club, Chemical Salesmen Assn., N. Y. Paint & Varnish Club. Hobbies: handball, boxing.

Edwin Rice Bartlett, v. p., and wks. mgr., Hooker Electrochemical Co., Niagara Falls, N. Y. Born: Hanover, N. H., May 12, 1883. Educat.: Dartmouth, A. B., 1904. Marr.: Margaret J. Porter, Niagara Falls, June 2, 1915. Children: son, three daughters. Bus.: American Light & Traction Co., N. Y., 1904-07. Development & Funding Co., Niagara Falls, 1907-09; Hooker Electrochemical Co., 1909 to date. Mem.: University Club of Buffalo; A. C. S.; Psi Upsilon Fraternity; former pres., Niagara Falls Rotary Club; Niagara Falls Country Club; Niagara Club; University Club of Niagara Falls. Hobbies: golf, tennis, bowling.

Hamilton Bradshaw, asst. chem. dir., E. I. Du Pont de Nemours & Co. Wilmington, Del. Born: De Kalb, Ill., Dec. 1881. Educat. A. B., Beloit College, 1902; Ph. D., John Hopkins Univ., 1905; research chemist, lab. dir., asst. chem. dir., E. I. Du Pont de Nemours & Co.

William Dunn Patten, pres., Monarch Chem. Co., v. p., Warner Chem. Co. and Westraco Chlorine Products, Inc., New York. Born: Brooklyn, N. Y., June 25, 1865. Educat. Brooklyn High School. Marr.: Clara Hoage, Brooklyn, June 4, 1895. Bus.: Mgr., Alex. J. Howell Soda Mfg. 1888-1901; pres., Monarch Chem. Co., 1901-27; v. p., Warner Chem. Co., 1914-27; v. p., Westraco Chlorine Products, Inc., 1917-27. Mem.: Odd fellows. Inventor of use of acid pyro phosphate of soda in baking powder. Hobbies: golf, bridge, billiards.

Edd Watkins Stevens, pres., Tiller, Glenn Co., Carlton, Ga. Born: Oglethorpe Co., Lexington, Ga., Aug. 24, 1887. Educat.: Common school. Mar.: Martha Mildred Johnson, Sandy Cross, Ga., Dec. 9, 1909. Children: 2 sons, 1 daughter. Bus.: 1908, bought interest in Cunningham, Stevens & Co., sold out, 1917; with Tiller, Glenn Co. since Jan. 1, 1918. Mem.: Masonic Order. Hobby: Baseball.

Benzol in Storage

Demand for motor fuel is seasonal, and the gasoline market fluctuates. If benzene is advantageously marketed for use in motor fuel, these facts must be met. Storage of benzene through periods of light demand or low gasoline prices is one way of maintaining a market, but difficulties present themselves. If benzene can be satisfactorily stored, it will have an effect upon the market for the pure products.

UP to the present benzols from which the unsaturateds have not been completely, or almost completely, removed by sulphuric acid, have been regarded as unsatisfactory for use in internal combustion engines, because they are liable to foul the engine. The chief troubles experienced when using such benzols are choking of jets by gummy matter, and the formation of resinous deposits in the induction, inlet valve pockets, and on the inlet valves, causing them to stick in their guides. There is little doubt that the constituents, which primarily give rise to resin formation, are certain of the unsaturated compounds present in such benzols. Although a benzol containing unsaturateds may be free or practically free from high boiling resinous material when freshly distilled, high boiling resins are produced on storage. The quantity of such resinous material formed and present in solution in the benzol, will depend on the conditions and time of storage, according to the fourth report of the National Benzol Association, reported in a recent issue of "The Chemical Trade Journal, London.

The conditions and maximum duration of storage, between the time of refining and final distillation of the benzol and its use by the consumer, are obviously of the greatest importance. The fact that benzol and other motor spirits containing unsaturated, (e. g., active carbon recovered benzols, adsorbent refined "cracked" petrols, etc.), when used almost immediately after recovery or distillation, have apparently proved satisfactory as motor spirit, is in agreement with the view that it is the resins partially or completely formed on storage which are chiefly responsible for objections to the use of such fuels. In practice, the period of storage between production and use may vary from about a week to 5-6 months, storage being usually effected in the dark in iron tanks, galvanised drums or tinned iron containers.

The difficulty of benzols resinifying on storage could, perhaps, be overcome to some extent by storing the benzol in the "once run" condition, and carrying out any necessary refining process immediately before distribution and use. The possibility of producing benzols, which will show little tendency to resinify on storage, although containing an appreciable proportion of unsaturateds, has been investigated in two directions: —(1)Whether such benzols can be produced by selectively removing, by suitable refining processes, the least stable unsaturateds chiefly responsible for resin formation. (2) Whether it is possible to prevent or inhibit resin formation by the addition of small quantities of volatile material immediately after distillation.

An examination of a large number of unwashed benzols has shown that there is no proportionality between the amount of unsaturateds present and the stability of benzols.

The results obtained in attempts to refine benzols by chemical methods, in such a way that only the least stable unsaturated compounds are selectively removed, have been given in the 3rd Report, as well as a brief account of preliminary investigations on the possibility of selectively removing the least stable constituents with adsorbents. Further investigations on the use of adsorbents are described and the results given in the present Report.

From the point of view of producing a benzol which is comparatively stable, although containing an appreciable amount of unsaturateds, the results of these investigations cannot be regarded as satisfactory. The experiments have shown that although a partial resinification of unsaturateds can be caused by chemical reagents or adsorbents, any improvement thus effected in the stability of a particular benzol, as determined by the ultra-violet light test, is roughly proportional to the reduction in the proportion of unsaturateds present, and only when the greater portion are eliminated will the benzol show little tendency to resin formation.

It was concluded, therefore, that the unsaturateds in crude benzols cannot be differentiated into those which are unstable and will cause resinification, and those which are stable, although such differentiation might be expected if resinification is caused only by di-olefines and not by mono-olefines. A variety of unsaturated compounds are present differing in stability between those which are comparatively stable and those which are unstable. In many experiments, although a reduction in the proportion of unsaturateds was observed, the benzol became less stable after treatment.

Some evidence has been obtained that this is due, either to the addition or formation by the treatment, of traces of substances which promote resinification; e. g., sulphur dioxide, peroxides, aldehydes and organic acids, etc., or to the removal of traces of substances which retard or inhibit resinification; e. g. phenols. This leads to the further conclusion that, in order to improve the stability of a benzol by selectively removing by chemical reagents or adsorbents the least stable unsaturateds, the effect of addition or removal by the treatment of traces of substances, promoting or inhibiting resin formation, must be taken into consideration. The most successful refining process will be one which removes and does not add substances which promote

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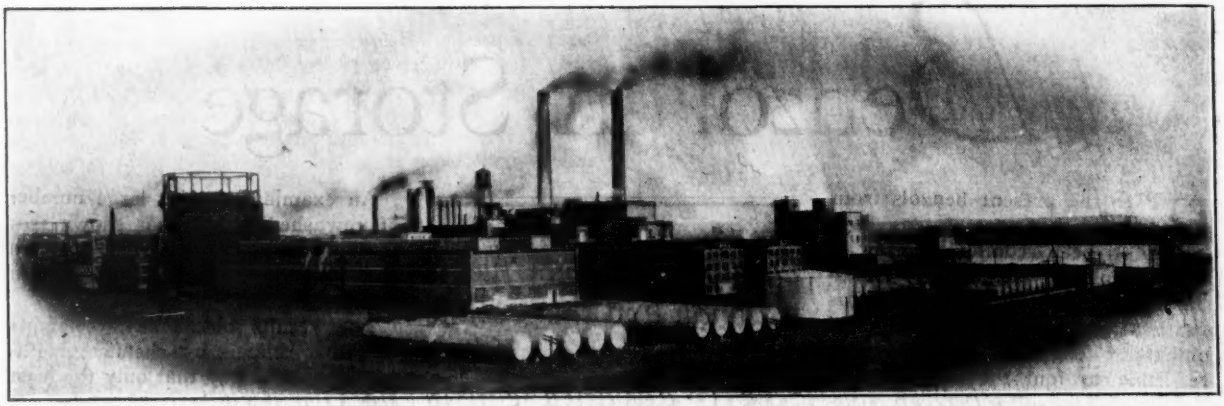


Butanol plant of Commercial Solvents Corp. at Peoria, Ill.

Butanol

By ARTHUR ORR
Sales Manager
Commercial Solvents Corp.

There is no denying the fact that butanol is the solvent that gave the lacquer industry its opportunity for unlimited expansion, and today butanol and its acetate are the most widely used solvents entering the lacquer industry. Butanol is made by fermentation of corn, and the price of butanol is directly based on the corn market.

THE research chemist, the production manager, the purchasing agent and the president, of any company, all are interested in the wise selection of raw materials for the finished product on which their reputation depends. Each of these men, however, will have his own special responsibilities and his own particular point of view. The chemist is absorbed in a study of the physical and chemical characteristics of his materials, he attempts new combinations; he must imagine and create. The production manager is chiefly interested in uniformity and availability; he is, above all, a realist. The director of purchases wishes information concerning price tendencies and the underlying factors which cause fluctuations in price and supply. The president must coordinate all the facts and recommendations submitted to him, but he must also contribute a certain wisdom and perspective which may take account of factors that are beyond the purview of any of his assistants.

During the past few years an increasing number of available and suggested lacquer ingredients have received generous attention in scientific, technical and trade papers, but most of the material published has been written for the chemist—and the chemist alone. This article is addressed primarily to the practical manufacturer and is intended to give him some of the underlying facts and figures about one of the principal liquid ingredients in modern lacquer. No attempt will be made to present the purely chemical aspect.

Although butanol is used directly or indirectly, in the metallurgical, textile, paper, film, perfume, flavoring, leather, cleaning, pharmaceutical and other industries, its oldest and its most important outlet today is in the production of lacquer.

Exact figures giving lacquer production during the last decade are not obtainable. Reasonable estimates, however, indicate that lacquer production since 1919 has not been far from the quantities shown in Plate No. 1 below. The "gallons" referred to in this chart mean gallons of material, after final mixing, and immediately before application. As the average butanol content per gallon of commercial lacquer has remained fairly constant during the past few years, this ratio has been used to some extent in correcting lacquer production figures which were obtained from various sources but which were often not in agreement. Any over-estimate

Plant of same company at Terre Haute, Ind.

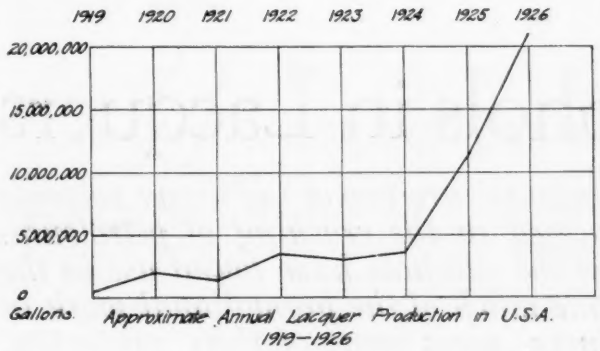


Plate 1

of lacquer production for a given year can only be explained by a sharp increase in the use of butanol, (per average gallon of lacquer) over and above the probable ratio which we have assumed.

Veterans in the lacquer business remember pre-war times when practically all lacquers were made with fusel oil and its derivative, amyl acetate, as the only liquid ingredients. The nitrocellulose coating industry at that time was so completely dependent on this meager source of solvent material that future growth appeared to be limited to very small proportions. By the end of the war, Bolshevism in Russia, prohibition in this country and disturbed conditions generally, had caused the fusel oil supply to sink to a low ebb, in spite of high prices. By 1920, these earlier high prices had attracted supplies of fusel oil from sources hitherto not tapped. At about this time there appeared coincidentally, but quite independently, two new products each of vast importance to the lacquer industry. These new products were low-viscosity cotton and a new fermentation solvent.

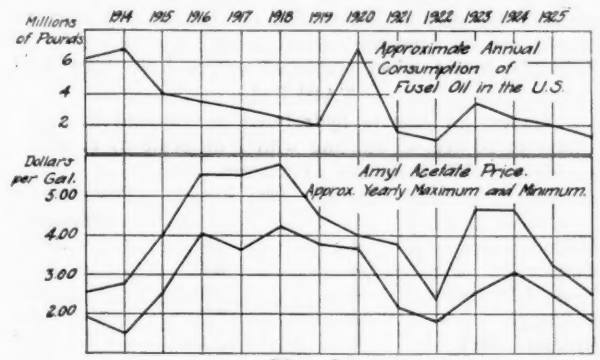


Plate 2

This new solvent, butanol, was immediately accepted by the lacquer technician. The raw material from which it was made, the fermentation process necessary for its manufacture and its actual chemical formula indicated close relationship to the fusel oil derivatives. Laboratory tests proved that it was pure and uniform. Butanol and its derivative, butyl acetate, were found to be admirable substitutes for amyl alcohol and amyl acetate as lacquer ingredients. But the production man was skeptical. He could only be convinced by the acid test of experience. From 1919 to 1922 the demand for butanol was small and far below the available supply. By 1923 the demand for butanol had grown to about 1½ million pounds per month but process difficulties unexpectedly restricted production. The effect of this butanol shortage caused the price and supply of fusel oil to double within a year. Fusel oil would probably have remained at a high price but for the production of butanol at a new plant and a return to normal conditions at the older plant. By the Spring of 1924 the supply of butanol again became equal to any demand and fusel oil gradually diminished in price and supply.

Plate No. 2 showing consumption of fusel oil and price of amyl acetate from 1913 to 1926 reflects, not only the effect of the war and of the temporary butanol shortage that began in 1922 and ended with 1923, but also the definite acceptance of butanol that finally occurred in 1925.

Fusel oil is a mixture of various impurities, which are formed, in small amount, along with ethyl alcohol, as produced by the yeast fermentation process. This small quantity of fusel oil must be separated from the alcohol before the latter can be used in any spirituous beverage such as

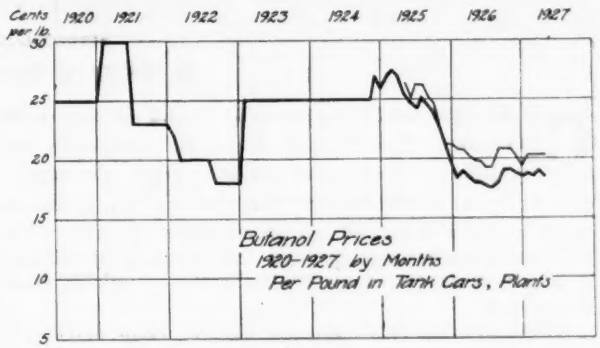


Plate 3

whiskey, brandy, vodka, etc. The amount of crude fusel oil available from various parts of the world was ample for the modest requirements of the pre-war lacquer industry, but it offered no hope of expansion.

The derivatives of fusel oil, namely amyl alcohol and amyl acetate, will always be readily consumed by the lacquer industry. The peculiar advantage of these products has never been satisfactorily explained on theoretical grounds but forty years production experience shows that no other type of solvent produces such durable, brilliant, smooth and adherent films as are obtainable through their use. The available supply of fusel oil is not susceptible of increase; it is now and will probably continue to be negligibly small as compared with the amount of butanol consumed. The merit of butanol in lacquer is perhaps best shown by the fact that fusel oil has fallen from its former price of about four dollars per gallon to considerably less than two dollars per gallon, in spite of the tremendous increase in lacquer production during the last two years.

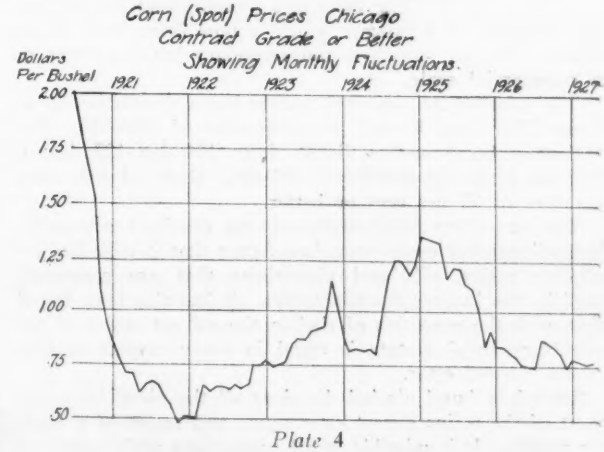


Plate 4

(Continued on page 754)

Secondary Alcohols in Lacquers

Secondary butyl alcohol and isopropyl alcohol are two of the many solvents manufactured from the products obtained in the cracking of petroleum. These alcohols as well as the acetates of the alcohols have found use in the lacquer industry. A man who has done much of the promotional work in introducing these products to consumers, gives some of their properties.

By J. Grant Park
Stanco Distributors Inc.
Subsidiary of Standard Oil Co. (N. J.)

CRUDE petroleum is practically devoid of olefins i.e. unsaturated hydrocarbons, but these compounds are formed in large quantities in the pyrolytic decomposition of mineral oils at high temperatures and pressures. Since pyrolysis is carried out on an extensive scale in the production of gasoline through the cracking of heavier oils, a large supply of olefins is therefore available from this source.

Olefins combine with sulfuric acid to form alkyl acid esters which when hydrolyzed produce alcohols and sulfuric acid. These reactions may be shown as follows:

$$CH_3\text{-}CH\text{=}CH_2 + H_2SO_4 = CH_3\text{-}CH(HSO_4)CH_3$$

Propylene — Isopropyl sulfuric acid

$$CH_3\text{-}CH(HSO_4)\text{-}CH_3 + H_2O = CH_3\text{-}CHOH\text{-}CH_3 + H_2SO_4$$

Isopropyl Alcohol

It was discovered by Mann and Williams[1] that a mixture of a mineral oil and sulfric acid simplified the reaction, and it was this important step which made practical the process of manufacturing secondary alcohols from refinery gases. The Standard Oil Co. (N. J.) working under assigned patents, are operating this process on a large scale for the manufacture of alcohols from refinery gases. The gases which are used contain a mixture of olefins from which isopropyl, secondary butyl, amyl and hexyl alcohols are obtained.

The uses for these alcohols have greatly increased during the past few years and it has been found that their esters are of special value in the lacquer industry. It is worthy of note that it is rather difficult to form the esters of these alcohols as they decompose in the presence of sulfuric acid. The Standard Development Department has worked out a process which is now being used in the manufacture of isopropyl and secondary butyl acetates on a commercial scale.

The commercial isopropyl acetate has a distillation range from 72-85 deg. C and has a gravity of .866-868. The secondary butyl acetate distills from 104 deg.-127 deg. C and has a specific gravity of .864-866. Both solvents show an ester of 85 per cent or better.

The secondary butyl acetate is an excellent nitrocellulose solvent and experiment has shown that it will dissolve all the resins, oils and plasticisers that are commonly used by the lacquer manufacturers. It has also been found that, with the exception of shellac, the solvent power of the secondary butyl acetate is equal in every respect to that of the normal ester.

Secondary butyl alcohol dissolves all the plasticisers and most of the resins except ester gums and resins of a similar nature. It is miscible in all proportions with castor oil and varies with the other oils. In general it can be said secondary butyl alcohol will dissolve all the raw materials that are soluble in normal butyl alcohol.

The dilution ratio for the secondary esters are slightly lower than those for the normal esters for toluene, and about equal for gasoline and water. However, if it is considered that the theoretical limit is never reached in actual practice, the slight advantage held in dilution ratios by the normal products is of small practical value.

While the evaporation rate for secondary butyl acetate is something faster than that of normal butyl actetate, practical results again show that it can be used in varying proportions in most combinations without impairing the drying qualities of the lacquer. Like normal butyl alcohol, the secondary alcohol forms a constant boiling mixture with water and is therefore an excellent dehydrating agent, and also a good preventative of blush.

The following tables which were taken from the result of experimental work show that the esters of secondary alcohols are very stable, so that the lacquer manufacturer should not be concerned about acidity developing in the finished product when secondary esters have been used.

TABLE I

Amount of acetate hydrolyzed at the end of one hour at 20 deg. C. starting with 1 molecule of caustic soda and 100 molecules of acetate.

Acetate	Lbs. NAOH	Lbs. Acetate	Percent ester hydrolyzed
Methyl	4	740	.54%
Ethyl	4	880	.368%
Normal Propyl	4	1020	.345%
Isopropyl	4	1020	.118%
Normal Butyl	4	1160	.323%
Iso Butyl	4	1160	.296%
Secondary Butyl	4	1160	.077%
Tertiary Butyl	4	1160	.008%
Iso Amyl	4	1300	.308%

TABLE II

Effect of temperature on rate of hydrolysis of Isopropyl acetate using same proportions as in Table I.

Temperature	Percent Ester Hydrolized after one hour.
0	.031%
10	.061%
20	.118%
30	.218%
40	.383%

The results given are expressed in percent of ester hydrolyzed after one hour treatment when 100 molecules of ester are used for each molecule of soda.

(*Continued on Page* 758)

1. U. S. Patent 1,365,043 (1921)

Lacquer Solvents from Petroleum

By D. B. KEYES
University of Illinois

Chemists are but beginning to tap the rich source of specialized solvent materials that lie in petroleum, a new field whose possibilities are here summed up by a man of notable industrial and technical experience. The properties and supplies of petroleum solvents will become real market factors.

PETROLEUM is undoubtedly the greatest future source for aliphatic organic compounds. It is regretable that petroleum with its many valuable constituents has found its only large scale use as a fuel, but it is pleasing to see the many recent attempts to develop petroleum as a source of pure organic chemicals. Perhaps the most promising field at present is the manufacture of alcohols and esters of the unsaturated gases evolved from cracking processes.

The higher aliphatic alcohols such as butyl and amyl alcohol and also the corresponding esters have been manufactured on a fairly large scale and in what seems to be a very satisfactory manner. It is undoubtedly hoped by the manufacturers to replace normal butyl alcohol and normal butyl acetate to a certain extent as solvents in the lacquer field with these secondary and tertiary higher alcohols and acetates.

Before reviewing these compounds it should be noted that secondary and especially tertiary alcohols are not like the alcohols with which we are familiar. Changing from primary to secondary and tertiary seems to change the entire physical characteristics of the compound. To illustrate, it will be noted that the secondary butyl alcohol has a lower boiling point than the primary alcohol and that tertiary butyl alcohol has a lower boiling point than either. Esterification with acetic acid, as has been pointed out several times, goes readily with the primary alcohols, not so readily with the secondary, and proves to be very difficult with the tertiary. This is due to the fact, as has also been pointed out, that the linkage between the hydrogen and the oxygen is very tight with the tertiary alcohols and very loose with the primary alcohols. On the other hand esterification with hydrochloride acid goes very readily with the tertiary alcohols but is rather difficult with the primary alcohols. This denotes the fact that the linkage between the oxygen and the carbon in the tertiary alcohol is very loose, and very tight in the primary alcohols. In other words these secondary and tertiary alcohols might be considered as "aliphatic organic hydroxides" rather than alcohols. It should be noted also that these secondary and tertiary alcohols resemble water more closely, especially in the lower members, whereas they resemble hydrocarbons more closely in the higher members.

At the present time several concerns in this country have small commercial plants producing these alcohols from the unsaturated gases leaving cracking stills utilizing sulfuric acid as the absorbent. After the products are absorbed in sulfuric acid they are hydrolyzed to produce the alcohols. There are a great many difficulties in the present methods, the principle difficulty being the number of steps necessary and the resulting loss of reagents. When the process involves the chlorination of a hydrocarbon and the subsequent hydrolysis, still further difficulties are encountered due to corrosion, etc. The ideal method of manufacture would be direct partial oxidation of the pure hydrocarbon with air as the oxidizing agent. Such a process is not impossible as there are on the market today several commercial products which are manufactured in a similar manner.*

There are listed below the various alcohols and esters which have been made in commercial quantities from petroleum together with a brief statement as to their properties.

Isopropyl Alcohol

This product has been made for a number of years from propylene. The manufacture has been more or less standardized and the product can be made at a very reasonable figure. Unfortunatly, however, isopropyl alcohol is too close in properties to ethyl alcohol, for example it has a boiling point of 82.4 deg. C. Its constant boiling mixture is approximately 90 per cent alcohol and 10 per cent water. As a solvent in the lacquer industry it has shown no advantages over ethyl alcohol and due to the differences in price it has practically dropped out of the field.

Secondary Butyl Alcohol

This product has been made in fairly large quantities and its manufacture seems to be relatively simple. It has a boiling point of 99.5 deg. C and its constant boiling mixture is approximately 73 per cent alcohol and 27 per cent water, and consists of two liquid phases. This mixture has a boiling point of 87.5 deg. C. It is therefore difficult to see why this particular alcohol should ever be popular as a lacquer solvent. It has, however, a pleasant odor with no choke, and this is of importance in the lacquer industry. It would not, however, be satisfactory as a substitute for normal butyl alcohol.

Secondary Butyl Acetate

This product is of more interest than the corresponding alcohol because its boiling point is 112.2 deg. C and it is more soluble in water than the normal butyl acetate. It also has a pleasant odor with no choke. At a relatively low price this new solvent should find a distinct use in the lacquer field.

Secondary Amyl Alcohol

This product it is understood is more difficult to obtain because of the relative scarcity of the amylenes in the cracked gases. It has a boiling point of 119.2 deg. C, it is insoluble in water and has a hydrocarbon-like odor with a slight choke. It is rather doubtful whether these secondary and tertiary alcohols will be satisfactory from a gum solvent standpoint. No data are available at present.

Secondary Amyl Acetate

This product has a boiling point of 135.138 deg. C and has a peppery odor somewhat similar to turpentine.

(Continued on page 756)

*Partial oxidations utilizing new types of catalysts are now being investigated at the University of Illinois.

Amyl Alcohol by Synthesis

By Eugenes E. Ayres, Jr.
Sharples Solvents Corp.

NATURAL gasoline, chlorine and caustic soda are the raw materials necessary for the manufacture of synthetic amyl alcohol, and for this reason the plant of Sharples Solvents Corp., the manufacturers, is located at Charleston, W. Va.

Natural gasoline differs from motor fuel gasoline in that it is derived from natural gas, and consists primarily of lower boiling volatile hydrocarbons. One of these hydrocarbons is pentane, of which the natural gasoline contains from twenty to forty per cent. Pentane has a pleasant, etheral odor and boils at about the temperature of a warm Summer day.

West Virginia is a substantial producer of gasoline from natural gas. Sufficient pentane is available locally to produce all the amyl alcohol that is likely to be consumed, but near-by mid-continent fields produce fifteen times as much as alcohol consumers could ever demand.

Very pure pentane is obtained by fractional distillation of gasoline.

All that is necessary to insure the production of only amyl alcohol is to start with pure pentane. Butane gives butyl alcohol and hexane gives hexyl alcohol. With modern rectification equipment it is a simple matter to exclude butane (which boils lower than pentane) and hexene which boils higher.

The difference between pentane and amyl alcohol in chemical composition is merely an atom of oxygen. Pentane is $C_5H_{12}O$ while amyl alcohol is $C_5H_{11}O$. The alcohol can not be obtained, however, in so simple a manner as oxidation. The process used involves, first, the formation of amyl chloride $C_5H_{11}Cl$ and, second, the hydrolysis of the chloride to the alcohol. These operations require chlorine and caustic soda, both of which are formed when salt water is subjected to electrolysis. In the Charleston district, salt water—all that is wanted—is pumped from deep wells, and rich coal deposits insure cheap power.

Amyl alcohol like butyl alcohol and many other organic compounds exists in several isomeric forms. Some of these isomers have more desirable properties than others. It is possible, for example, to have two perfectly pure amyl alcohols, one of which would have a much higher boiling range than the other. It is naturally desirable to obtain the higher boiling points, and this is accomplished by a proper selection of conditions in the manufacture of amyl chloride. The process used is entirely continuous and automatic and the amyl chloride flows out with constant composition.

Amyl chloride boils at about the same temperature as water. It has a specific gravity of 0.88 and has a pleasant ethereal odor. It is chemically very stable.

The chloride is treated with aqueous caustic soda to obtain the reaction:—

$$C_5H_{11}Cl + NaOH = C_5H_{11}OH + NaCl$$

The crude alcohol is rectified to produce the chemically pure amyl alcohol called "Pentasol."

Pentasol has a boiling range from 116 degrees C to 136 degrees C. It contains about twenty-five per cent of the highest boiling amyl alcohol isomer (normal amyl alcohol) boiling at 137 degrees C, and it is this constituent that gives it the unusual boiling range. The largest proportion of Pentasol, however, consists of the isomers found in fusel oil.

An outstanding characteristic of this product is its uniformity. This quality is a consequence of the process of manufacture. The raw products are constant in properties and the plant is so devised that only radical changes in operation could affect the properties of the amyl alcohol.

The only by-product in any volume is hydrochloric acid.

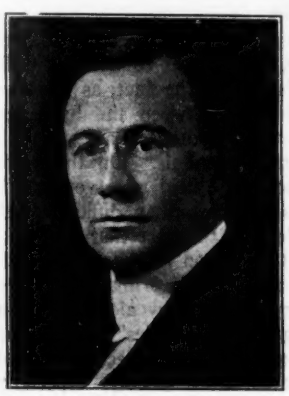
Some of the amyl alcohol is being converted to the acetate. This is accomplished by heating the alcohol with acetic acid. The acetate has a higher and narrower boiling range than would be expected, but in other respects it derives its quality from the alcohol used as its raw product. For example, the acetate has no residual odor and contains no alcohol or ester other than amyl.

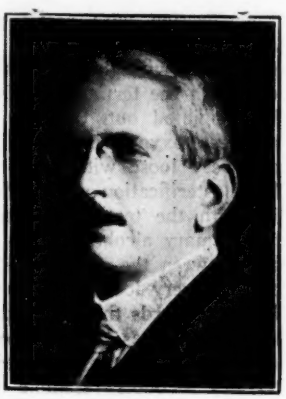
The acetylation unit has a capacity of 115,000 gallons per month of the acetate.

What Do You Know About the Chemical Industry?

During the general popularity of "What Do You Know?" throughout the Country CHEMICAL MARKETS will publish a series of questions relative to the chemical industry.

1. The market for what industrial chemical has been seriously affected by the flooding of the Mississippi?
2. The stock of what chemical manufacturing concern has the sharpest advances and declines of any chemical stock listed on the New York Exchange?
3. What chemical product recently manufactured on a large scale is used in making non-freezing dynamite?
4. What imported chemical product always sold at an agreed price goes on an open selling basis June 30?
5. Acetic anhydride is manufactured in this country as a by-product of chemical consuming manufacturer. Who is the manufacturer?
6. What district of the United States is rapidly becoming a new center of chemical manufacture?
7. The foreign manufacturers of what important chemical product are being sued by the Government under the Sherman Anti-trust Law?
8. Who are these two men?





9. What are the principal basic sources of organic solvents?
10. What chemical manufacturing concerns use the following brand names? Pentasol; Imperial; Kesso; Lohocla.
11. What are the sources of the following solvents? Normal butyl alcohol; ethyl alcohol; secondary butyl alcohol; synthetic amyl alcohol; carbon tetrachloride.
12. In what respect is the Chemical Exposition departing from its usual procedure this year?
13. Control of what large manufacturer of solvents was recently taken over by an outstanding oil company?

(Continued on page 752)

Solvents Containing Chlorine

Consumption of carbon tetrachloride lags production capacity for want of research. Electric power producers suggest chloroform manufacture as outlet for power. The future of ethylene dichloride hinges on its true cost as compared with carbon tetrachloride for a given solvent use. Tetrachlorethane has disadvantageous toxic effects and has been replaced largely by acetone in lacquers. Dichlorethylene is not produced in America. These are some of the important facts affecting solvents or the making of types of solvents containing chlorine.

OF the making of types of solvents there seems to be no end, and the recent development of the artificial silk and nitrocellulose lacquer industries has given great impetus to their manufacture. Solvents, no matter what their nature, must compete with heat or water or petroleum or coal tar products, a quartette difficult to equal on economic grounds and often on technical grounds. The economic status of a solvent for a given technical use is often determined by cost and after that by flammability, relative toxicity, relative solvent power, tradition, transportation, etc., As to cost, it is regrettable but true, that cost does not always get beyond bold comparisons of price per pound or gallon. It is somewhat like a common situation in the dyestuffs industry, where the consumer is cold to the introduction of concentrated dyestuffs because he has to alter his formulas, or feels that waste will be greater with strong than with weak dyes. Again, the cost consideration is subtly influenced by the cheerful indifference of the American public to the dangers of volatile flammable substances. A nation possessed of twenty million or more motor trucks and cars and an annual fire record that is staggering, is not greatly disposed to buy a non-flammable household or dry-cleaning solvent if it "costs" more than a flammable one.

A number of solvents containing chlorine as one of their constituents have long been known and some have been used. Others are little more than laboratory curiosities.

Carbon Tetrachloride

It is difficult to say anything that is new about this substance, the best known and most used of this class of solvents, but a few recent investigations of novel or improved uses are well worth knowing. Carbon tetrachloride, (tetrachlormethane, perchlormethane) was discovered in 1840 and had uses in Europe as a solvent long before its introduction here. Its commercial history in America begins in the early nineteen hundreds. Good statistics of imports are not available for these early years. In 1914 the imports were 572,910 pounds with a declared value of $28,300 or 4.9 cents per pound. The World War really started fair sized American manufacture. In 1925 the imports were seven pounds of C. P. goods, and the American production of technical grades was 16,163,104 pounds with an average price of six cents per pound, i.e., 3.9 per pound with a sixty-five cent dollar. The C. P. grade of American manufacture is a refined technical grade and has a limited use as an anthelminthic for hook worm disease. Five manufacturers shared the 1925 business which was mostly domestic; and all five had plant capacity beyond current consumption. As with chloroform, carbon tetrachloride has a fascination for chemists and engineers who study the chlorination of methane and for power companies contemplating chlorine cells for current consumption. Its manufacture is an adjunct of carbon bisulphide manufacture and practically all of the carbon tetrachloride in America is made by chlorinating carbon bisulphide in the presence of a catalyst.

Between the years 1916-1924 at least fifty patents covering various methods of manufacture have been granted in America and its properties since 1890 have been commented upon and examined by many workers in the chemical field. Much of this literature, however, is lacking in practical interest because the amount of carbon tetrachloride either by weight or by volume necessary for a selected carbon action and the art of its handling were given scant attention. The recital of its uses as a solvent would fill a page of this paper; no attempt will be made here to recite these uses, but a typical example is selected: A large possible use is in the recovery of wool grease in the woolen industry. Any wool grease recovery from the American point of view must be profitable, that is, unless local ordinances forbid stream pollution, American wool grease is liable to be part of the plant discharge into the nearest sewer or stream. There are some notable exceptions to this state of affairs, but great quantities of wool grease are annually wasted. If it was recovered on a large scale, the grease products would require a market not now in existence. It is otherwise in Europe, but economic conditions are vastly different there. Granting either that a recovery is profitable through the sale of the products or that it is a method of trade wastes disposal, the selection of a solvent would largely depend on cost, and here, the American woolen mill very naturally turns to petroleum products or solvent naphthas. Using such, fire risks are minimized by the use of closed systems, and as a result, carbon tetrachloride though superior as a solvent does not compete on a rough and ready cost basis.

Carbon tetrachloride aside from its great solvent properties has two remarkable properties in this class of solvent. It is not flammable and it is not a conductor of electricity. Incidentally, these two properties make it indispensable in fighting electrical fires and in the equipment of transformer apparatus. It is also a uniform compound and not a mixture. It is a solvent at low temperatures. It freezes at about -11 deg. Fahrenheit and hence every motor car and truck should have a handy gallon as part of its equipment. Its toxicity is relatively less

The life blood of a chemical substance in commerce is diversity of use and, while carbon tetrachloride is here considered primarily as a solvent, a new use outside of the solvent field is worth mention. It has been determined that forty volumes of ethyl acetate mixed with sixty volumes of carbon tetrachloride is a highly effective fumigant against weevils in grain, and since 1925, this mixture has come into practical use and tends to displace carbon bisulphide for this purpose, (United States Department of Agriculture, Bulletin No. 1313—1925).

To sum up, carbon tetrachloride has many valuable properties and uses, but its consumption lags for want of careful applied research to its economics in the solvent field. There must be something left to do for a non-flammable high-powered solvent, when, as for instance, the dry cleaner invests in concrete fireproof rooms built like an old fashioned black powder mill, and equipped with elaborate apparatus for the handling and recovery of flammable solvents. There is no need for more manufacturing facilities, but a real need for proved uses, at a "cost" that is not based on a crude comparison of price per pound or gallon.

Chloroform

Chloroform (methenyl trichloride; trichloro-methane; formyl trichloride) was discovered in 1831, and as early as 1852 the American Journal of Pharmacy (1852-147) had listed uses as a solvent. In 1900, the American production was 396,540 pounds valued at 24.7 cents per pound. In 1925 the production was 1,305,868 pounds valued at 22 cents per pound, i.e., 14.3 cents per pound, with a sixty-five cent dollar. So, in twenty-five years, the production for all purposes increased but 332 per cent and the value declined 58 per cent. Four manufacturers shared in the 1925 production, and others considered going into the business. There are numerous processes of manufacture that are possible, but the most uneconomic one is that of the chlorination of the natural gas, methane. The chlorination of methane is a difficult art, as four products, methyl chloride, methylene chloride, chloroform and carbon tetrachloride result in varying amounts depending on ratio chlorine to methane temperature, light, catalysts, absence of explosions, etc., and the before mentioned products must be separated with great care. Nevertheless, the efforts of hydraulic and steam power stations find outlets for electric current lead chemists and engineers to suggest the installation of chlorine cells with the chloroform market in view. Very recently two widely separated power projects tentatively included chloroform as an outlet for electric power and in amount of chloroform sufficient to make four times as much as is now consumed. Chloroform as an anaesthetic tends to decline in use, and as a solvent its future does not look encouraging enough to warrant any such expansion.

Pure chloroform is not combustible; is slightly soluble in water, and is highly volatile. Its volatility and its anaesthetic properties limit its general use outside of medicine and the fine chemical industry. It is used in small quantities by dry cleaners for spotting purposes but, for obvious reasons, the use is not encouraged. It is an excellent solvent for several of the elements, and for certain fats, resins, alkaloids and other organic compounds, and indispensable in laboratory technique.

Dichlorethylene

This substance, a mixture of two dichlorethylenes which are stereo-isomers, has no reported commercial production in America. It is made abroad but not imported here to any extent. Its hot vapor can be burned. Heated mixtures of dichlorethylene, alcohols and caustic soda or caustic potash, produce an explosive gas, chloracetylene, (Chem. Zeit. 48, 142). In Europe it is used in the extraction of perfumes and to a slight extent for other solvent purposes.

Ethylene Chlorhydrin

Ethylene chlorhydrin, (chlorethyl alcohol, glycol chlorhydrin), has known since 1859. It is a well known step in the production of mustard gas, but an American manufacture for commercial purposes is recent. There is, at present, one American manufacturer. There are no imports. This substance is miscible with water, and decomposes in water, which property tends to limit its use as a solvent. It can be made an important step in the manufacture of ethylene glycol. In Germany, it has important uses in dye synthesis.

Ethylene Dichloride

This chlorine compound has been known since 1795 under at least four other names,—"Dutch liquid," elaylchloride, ethylene chloride and dichlorethane. Its manufacture is a step in the chlorination of gasoline fractions for the manufacture of glycols, etc. It is now made in America in quantity and has recently been offered in tank car lots at six cents per pound. There are no imports of moment. It is an excellent solvent of many organic substances, such as greases, oils and fats, and is fairly stable in the presence of water and is therefore less corrosive under such conditions than carbon tetrachloride. However, it is flammable and in this respect carbon tetrachloride has a considerable advantage. Its relative toxicity is low and, at one time, it was used on a small scale as an anaesthetic. Its large commercial use probably hinges on true cost as compared with carbon tetrachloride for a given solvent use.

Tetrachlorethane

(Acetylene tetrachloride)

This solvent is made in America by two manufacturers. but the United States Tariff Commission does not publish the production figures in accord with their rule. The imports in 1925 were 375,129 pounds. It is a good non-flammable solvent of numerous fats, waxes, tarry substances, varnishes, paints, and especially of cellulose acetate. In the last named application, however, it has been largely replaced by acetone. Like carbon tetrachloride it should be handled in lead or tin lined vessels. Its toxic properties, in concentration, causing jaundice, fatty degeneration, albuminaria and haemoglobinuria, are well known, and it should therefore be used only under the strictest sanitary conditions and by those skilled in its application. Its indiscriminate use in several European countries has been restricted by law. Its derivatives, dichlorethylene and trichlorethylene, do not have the toxic properties of the parent substance and are therefore preferable, other thing being equal, for use by unskilled handlers of solvents.

Trichorethylene

This substance is made in America in small quantities by at least three manufacturers. The American production is not reported by the United States Tariff Commission in the 1925,—"Census of Dyes and Other Synthetic Organic Chemicals." The 1925 American imports were 77,602 pounds. It is a good non-flammable solvent of its type, fairly stable in the presence of moisture and is used in the perfumery and rubber industry and in dry cleaning. It is also incorporated into soaps. It should be noted that heated mixtures with alcohols and caustic soda or caustic potash, produce an explosive gas, chloracetylene, (Chem. Zeit. 48, 293).

Miscellaneous

The use of vanadium oxytrichloride has been suggested recently. It has no commercial use in quantity so far, but is an interesting solvent for some organic compounds if water can be kept out of the reaction. It will decompose in water. Propylene dichloride and propylene chlorhydrin have also recently been suggested as solvents. They are much like ethylene dichloride and ethylene chlorhydrin in their properties. Their considerable use will probably be largely measured by their cost as compared with the last named.

Conclusion

There are other compounds containing chlorine which have some solvent properties, but they have no importance is solvents at this time. The purpose of these remarks is

(Continued on page 752)

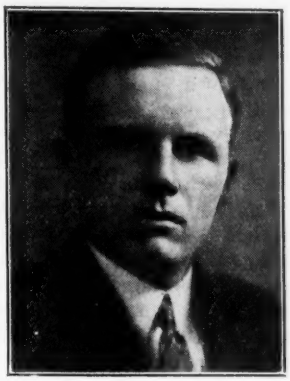
[News and Markets Section]

Merck and P-W-R in $9,000,000 Merger

Stock in Ten Year Voting Trust with Frederic Rosengarten as Chairman of Board and George W. Merck, President—Merck name to be Retained—Policy to Remain Unchanged.

Stockholders of Merck & Co. were notified May 11 of the consolidation with Powers-Weightman-Rosengarten Co.

Under the reorganization the new company, under the name Merck & Co., Inc., will acquire the businesses and substantially all the assets of both firms, taking over from Powers-Weightman-Rosengarten Co. net assets in the neighborhood of $5,000,000, while Merck & Co. will transfer to it assets valued at about $4,000,000.



Geo. W. Merck

The good will and trade marks of both companies will be conveyed to the new company without payment. Formation of the new company involves no new financing or public issue of securities. Merck & Co. Inc. pays Powers-Weightman-Rosengarten Co. for the assets taken over, approximately half in six per cent. bonds, the remainder in stock. The present Merck & Co. will be paid by the new company entirely in its stock, giving the Merck interests the majority of the stock holdings.

All the new stock will be placed in a ten-year voting trust with George W. Merck, president of Merck & Co., Frederic Rosengarten, vice-president of the Powers-Weightman-Rosengarten Co. and Richard E. Dwight, partner of Hughes, Rounds, Schurman & Dwight, as voting trustees. Directors will be elected from the present boards of the respective companies. The P-W-R board now includes the members of the Rosengarten family active in the business, Messrs. Adolph G., Frederic, Joseph and George D. Rosengarten. The Merck & Co. board, besides officers of the company, includes Waddill Catchings, of Goldman, Sachs & Co., E. H. Green, of Sullivan & Cromwell, Philip Lehman, of Lehman Brothers, and George W. Perkins, son of the late George W. Perkins, who recently succeeded to the place on the board of his father-in-law, George Merck, the founder of Merck & Co., who died last October.

The new company will be operated by a management combining the strong points of both organizations. Frederic Rosengarten will become chairman of the board, and George W. Merck, President. He has not yet made announcement of the personnel of the new management. Plans of consolidation are agreed upon by the principals and approved by the directors and counsel. Stockholders of Merck & Co. will be asked to approve the plan at a meeting on June 1st.

The consolidation brings together chemical establishments identified with the very beginning of modern industrial and pharmaceutical chemistry. Merck & Co.'s origin was in an ancient pharmacy in Darmstadt, Germany, which came into the possession of Friedrich Jacob Merck in 1668, and which has remained in the Merck family for 259 years. This was the nucleus of the great chemical establishment now known as E. Merck, Darmstadt. Heinrich Emanuel Merck who took over the pharmacy in 1816 was an intimate friend and collaborator of Liebig, and he started it on the road from pharmacy to factory. Pure alkaloids were a specialty of the founder of the Merck factory and his achievements include the original manufacture, on a commercial scale, of morphine in 1827, codeine in 1836, cocaine in 1862.

The firm which eventually became Powers & Weightman was established in 1818 at Arch St. near 12th, in Philadelphia. Rosengarten & Sons were the outgrowth of a partnership formed by two Swiss chemists who manufactured chemicals in 1822. The firm took over the plant and assets of Powers & Weightman in 1905 and became the Powers-Weightman-Rosengarten Co. of modern times. They were among the first in America to produce and concentrate sulphuric acid and among their first products were quinine, ether, later morphine, and subsequently calomel, bichloride of mercury and strychnine.

The firm of Farr & Kunzie was established in 1818, in Philadelphia to manufacture chemicals. Kunzie retired in 1836 and Thomas H. Powers and William Weightman associated with John Farr under the name of John Farr & Co. and five years later the firm became Farr, Powers & Weightman, which after the death of Mr. Farr in 1847, became Powers & Weightman.

Frederic Rosengarten

Two Swiss chemists in 1822 formed a partnership named Zeitler and Seitler. These partners fell into a dispute and the accountant, George D. Rosengarten, was called in as mediator. Young Rosengarten had reached Philadelphia on a sailing vessel from Holland, scion of a family but ruined by the Napoleonic wars. He bought out Seitler, and the firm name became Zeitler & Rosengarten. Zeitler sold out in 1824, and George D. Rosengarten continued the business under his own name, till N. F. H. Denis, became a partner in 1840. The firm continued as Rosengarten & Denis until 1853, when Denis withdrew.

In 1854 two sons, Samuel and Mitchell became partners and the firm became Rosengarten & Sons. Harry

B. and Adolph G. Rosengarten were admitted to partnership in 1860, but the latter was killed at Murfreesborough, Tenn., being at the time senior major and in command of the 15th Pennsylvania Cavalry. George D. Rosengarten retired in 1879, and the firm was continued by H. B. Rosengarten and his sons, George D. and Adolph G. In 1905 Powers & Weightman were taken over by Rosengarten & Sons and the Powers-Weightman-Rosengarten Co. was established. Within the last five years in cooperation with Les Etablissements Poulenc Feres, arsphenamine, neoarsphenamine, sulfararsphenamine were placed on the market, and with the Rockefeller Institute, tryparsamide. Among their products are also included a comprehensive list of high grade reagent chemicals.

Two centuries after the Merck business was established in Darmstadt, Wilhelm Merck became its guiding spirit. He sent his younger son, George Merck to manage the American agency in 1891. The business was started modestly at 71 William St., New York, and in 1896 moved to the spacious Merck Building at University Place and 8th St. In 1899, the Company began the manufacture of chemicals in a plant established at Rahway, N. J. Branches were opened at St. Louis and Montreal. The move to 45 Park Place was made in 1911, and as the plant at Rahway expanded, need for closer connection between offices and factory became more acute, and in 1926, the main offices were established in a commodious Central Office building, at Rahway.

Frederic Rosengarten, chairman of the new company, is the youngest of the four brothers who have conducted the affairs of the Powers-Weightman-Rosengarten Co. in recent years. He is a graduate of Princeton and completed his scientific education, with studies in chemistry abroad. The new president, George W. Merck, is great-grandson of E. Merck, founder of the firm in Darmstadt, and son of George Merck, who founded the independent American house. George W. Merck was born on March 29, 1894, in New York City, and upon graduation from Harvard in 1915, he entered the business, holding in succession various positions until he succeeded his father as President in 1925.

J. S. Gerceau, formerly assistant advertising manager Detroit Graphite Co., Detroit, has been appointed advertising manager of The Trus-Con Laboratories, Detroit, and Agetex paints and Stonetex liquid cement.

DEMAND FOR NITRATE

Advances in the price of cotton have stimulated demand for nitrate of soda in the South, say Parsons & Petit, New York, in bulletin to the trade, but, the market is very quiet, with May and June quoted at $2.60, July and December $2.10 and January and June 1928 at $2.15, and very little interest shown in futures. The firm further say:

"In our circular of Sept. 25, 1925, we supplemented our nitrate of Soda chart, with prices of 95%, for 1923 and 1924, taken from actual sales on our books. Below you will find the monthly records for 1925 and 1926, 95%, to which 5c per 100 will have to be added for 96% West Coast Assay, or 2-½c for 96% Arrival Test:—

	1925.	1926.
January	2.52 ½	$2.72
February	2.62-½	2.71
March	2.65	2.72
April	2.62	2.63
May	2.52 ½	2.63
June	2.55	2.52-½
July	2.44	2.33
August	2.47	2.34
September	2.52	2.36
October	2.55	2.42-½
November	2.59	2.54
December	2.63	2.58

According to cable just received from the West Coast, the shipments during April were as follows: 56,000 tons shipped to Europe; 55,000 tons shipped to United States, Atlantic seaboard; 7,200 tons shipped to Honolulu; 3.800 tons shipped to Japan; 2,000 tons shipped to United States, Pacific coast; 200 tons shipped to China.

Production during April amounted to 97,495 tons, against 215,900 tons, in April 1926, and prices remain remarkably firm considering the few trades reported under free selling. May is held at 16 shillings and on May 6, London quoted 16s/3d for June, with 16s/6d for November-December 1927.

Production of glycerin in Spain is approximately 2,500,000 to 3,100,000 kilos annually and 2,100,000 Kilos. The export records make no distinction between crude and refined. In 1925, 700,600 gilos valued at 910,780 pesetas were exported and in the first nine months of 1926, 584,900 kilos valued at 760,370 pesetas. Imports are relatively small and decreasing.

GERMAN NITROGEN PLANS

(*Special to* CHEMICAL MARKETS)

Washington, D. C., May 11—In spite of the strength and influence of the German Dye Trust and the Nitrogen Syndicate, other German fixed nitrogen enterprises are reported to be preparing to launch new production units, according to advices from Trade Commissioner W. T. Daugherty, Berlin. The most pretentious plan according to reports in Germany is contemplated by "Hibernia" company, to put the Mont-Cenis process on a mass production basis, by the end of 1927. Gewerkschaft Mont-Cenis, original owner of patents to fix nitrogen at lower pressure and temperature over a strong catalyst, enlisted "Hibernia" interests, in which the Prussian State participates, some time ago. Gas-Verwertungs G.m.b.H. was founded at Sodingen, 60 per cent shares being acquired by Roechling concern, controlling Mont-Cenis, and the other 40 per cen by Hibernia. This new company received a building loan of 28 million marks to finance the Sodingen works, and a similar plant to be located on the Shamrock pit, belonging to Hibernia. The loan is to be amortized from profits of the proposed plants. Neither Mont-Cenis, nor Maxhuette, nor Roechling concern, controlling these corporations, under wrote the loan. Roechling Mont-Cenis concern exchanges for this financing by the State the operation by "Hibernia" of its patents."

To promote plants to fix nitrogen by use of hydroelectric power, a Bavarian company Untere Isar A. G., of Munich was formed two years ago. Munich dispatches state that an American consortium stands ready to finance a production unit, for location on the Isar river falls, if the Bavarian state will underwrite the loan. Another proposition is that of Kloecknerwerke (Ruhr) to join interests with a potash plant to produce potassium nitrate at Rauzel.

Potash produced in the United States last year amounted to 46,324 tons short tons of crude potash salts. Sales by producers aggregated 51,369 tons of crude potash, worth $1,083,064, the amount being chiefly from California brines and the distillery residue at such plants as the United States Industrial Alcohol Company's plant at Curtis Bay, Baltimore.

LONDON CHEMICAL MARKET QUIET BUT STEADY

Caustic Soda Moving Better—Nitrate of Soda in Small Supply and Firm—Sulfur and Aniline Oil in Good Demand—Linseed Oil Rising on Good Market

London, May 2—Market for heavy Chemicals continues quiet, but much more steady. Enquiry shows improvement both for spot and forward delivery and some prices are higher. Caustic soda demand has been more satisfactory both for home and export trade. Chloride of Calcium is rather quiet at £5 per ton. Bicarbonate of Soda is quiet and unchanged. Sulfate of Copper attracts good attention, price is firm at £25 per ton for best English brands. White powdered Arsenic is quiet at £16 per ton ex-Cornwall Mines. Oxalic acid has a better sale at about 3 pence per pound. Nitrite of Soda is doing more business both for spot and future delivery; price is about £19 per ton for odd lots ex-store. Red prussiate of potash is moving steadily at 1s 8d per pound. Nitrate of soda is in limited supply and price firm. Both caustic and carbonate of potash have a quicker sale and prices remain firm. Sulfur of all grades is in good demand with supplies rather scarce and prices strong. Aniline oil and salt are more active at about 7d per pound. Acetic acid is in good demand at £37 per ton for 80 per cent quality; 40 per cent is rather scarce at £18 per ton. Grey acetate of lime shows some activity at £15.10s per ton for 80 per cent; brown is in small supply at £9. Acetate of Soda is offered freely at £18.10s per ton. White acetate of lead is slow at about £44 per ton and brown is neglected at £41. Tartaric and citric acids are in strong demand at full rates.

Oils—Arrivals of Seed in Hull have been more plentiful and more business is doing in consequence. Linseed Oil is the feature and is a rising market at £32.5s per ton naked, ex-Mills.

Dr. John H. Haerry, Dr. F. Frohlich and Chas. Mulligan will sail for Europe in June for a three months textile study. They will visit textile mills, textile machinery manufacturing establishments, and other affiliated industries to study the newest developments in manufacture and processing of textiles, in the manufacture of textile machinery, and fabric novelties. Dr. Haerry and Dr. Frohlich will cover the textile centers of Continental Europe, and Mr. Mulligan will visit England and Scotland.

John M. Weiss and Charles R. Downs, Chemists Building, New York, consulting chemists and chemical engineers, formerly in partnership, have incorporated and will continue business at the same place under the title Weiss and Downs, Inc.

Michigan Alkali Co., J. B. Ford president, has appointed Irving H. Taylor director of sales to succeed Eugene M. Taylor, who has resigned owing to ill health.

Earl of Leven and Melville, chairman of the board of Borax Consolidated, Ltd., British company which control borax mines in Death Valley, Cal., is making a tour of inspection of properties.

ZINC SPECIALISTS

J. A. Singmaster, general manager Technical Department, and F. G. Breyer, Chief of Research who resigned their positions with New Jersey Zinc Co., on May 1st have opened a consulting office at 1640 Graybar Building, 420 Lexington Avenue, N. Y. Mr. Singmaster's service of twenty-seven years with the zinc company embraced various positions in its large plants at Palmerton, Pa., of which he was general superintendent from 1912 to 1917, leaving that position to become general manager of the Technical Department. Mr. Breyer was with the company for seventeen years, first as Chief of the Testing Department, and for the last ten years as chief of research division.

Gatineau Paper Mill, of Canadian International Paper Co. has begun production. The first paper machine is in operation, and three other machines will begin production within a few months. Total capacity is 600 tons per day. The company owns more than 8,000 square miles of timber limits on the Gatineau River, all of the pulpwood being water driven to the mill, one of the most modern type of construction, and the machines are electrically driven.

BRITISH—I. G. MERGER PRACTICALLY CONFIRMED

Advices received in this country from Berlin early this week practically confirm rumors which have been going the rounds to the effect that an amalgamation has taken place between the I. G. Farbenindustrie Aktiengesellschaft (the German dye trust) and Imperial Chemicals, Ltd., England, consisting of a combination of Brunner, Mond & Co., Nobel Industries, Ltd., United Alkali Co., Ltd., and the British Dyestuffs Corp. all of England.

Sir Alfred Mond, of Brunner, Mond & Co., is at the present time in Germany, having gone there as a guest of the German dye trust. Preceding a conference with Herr Duisberg, head of the chemical works of Fred. Bayer & Co., Leverkusen, Sir Alfred inspected the air fixation plant at Leunawerke. While no definite statement has been issued by either party to the agreement, it is believed that negotiations for the merger were completed at this meeting of the recognized chiefs of the chemical industry in their respective countries.

The consolidation of these tremendous interests in not entirely unexpected inasmuch as some of the individual companies which go to make up the combines are already quite close to each other. For instance, Nobel Industries, is a large stockholder in Koeln Rottweiler Explosives Co., now a part of the German dye trust.

Sales of lead pigments in 1926 decreased 6 per cent, compared with 1925; sales of zinc oxide decreased 7 per cent, and sales of zinc salts decreased 4 per cent. Sales of lithopone increased 10 per cent, compared with the former high record made in 1925; exports of lithopone, which amounted to 1,941 short tons, increased 51 per cent. Exports of zinc oxide amounted to 14,661 tons—a gain of 35 per cent, compared with 1925, and the largest quantity exported since 1919.

Rohm & Haas Co., Philadelphia, has moved its offices to 222 West Washington Square. New Bell telephone is Lombard 9260, and new Keystone telephone is Main 1681.

Salary of the Chief of Bureau of Chemistry and Soils has been fixed at $7,500 a year, and applicants must file papers required with Civil Service Commission by June 7.

EXPORTS HIGHER FOR FIRST QUARTER OF 1927

Advance of 13% Over Same Period Last Year—Coal Tar Products Show Greatest Gain—Believed Due to British Coal Strike—Fertilizers Also Show Gain—Naval Stores Off Slightly—Sulfur Down 15%

(*Special to* CHEMICAL MARKETS)

Washington, D. C., May 10—Exports of chemical and allied products rose 13 per cent in the first quarter of 1927, from $40,332,000 in January-March 1926 to $45,710,000 in January-March 1927. Imports, on the other hand, declined 23 per cent from $68,321,000 to $52,803,000, according to Department of Commerce. These figures show a decided change from the trade during the corresponding periods of previous years when exports were usually smaller and imports much heavier than the later periods of the year. The difference between exports and imports of $7,100,000 was also less.

In the outward movement the tremendous gain in coal tar products was the most important change, this being due to the shipments of crude coal-tar products, especially benzol and tar. These high figures are undoubtedly the indirect result of the British coal strike, since European consumers have looked to the United States for a larger part of their supplies which formerly were furnished by England. England's purchases of American benzol also increased considerably, to say nothing of Germany's and the Netherlands' orders; while France, which country usually procures the bulk of its requisites of tar from England, purchased over 250,000 barrels worth $1,354,000 during the first three months of this year from the United States.

Another change was the fertilizer group which improved over one-fifth due to the activity of the ammonium sulfate trade while imports of fertilizers diminished one-half, chiefly on account of the falling off in sodium nitrate.

Two per cent reduction in naval stores exports to $6,458,000 for the first quarter of this year was made in foreign shipments of wood products. Only one half as much wood rosin or $447,200 (24,630 barrels) left the United States for foreign countries the current quarter as in the corresponding quarter of last year. Of total rosin shipped abroad this quarter, Germany surpassed England with 20 per cent. of the total of $4,690,000 (230,000 barrels). In Latin American, Brazil and Argentina were the best customers, and in the Far East, Japan and Nethellands East Indies. In the spirits of turpentine trade, England, as before, was the best customer with 28 per cent of the total followed by Netherlands, Germany, Canada and Argentina.

There was a general downward movement in the incoming shipments of gums and resins, with the largest diminution in varnish gums, which declined from $6,825,000 (26,549,000 pounds) to $5,203,000 ($24,329,000 pounds). All the various kinds were less, with shellac receipts equaling $2,544,000 (6,626,000 pounds). Although crude camphor fell from $421,000 (706,000 pounds) to $337,000 (666,000 pounds) refined and synthetic camphor rose somewhat to $224,400 (355,000 pounds), and $276,000 (574,000 pounds) respectively. There was nothing significant about the trade in the other gums.

Once more exports of coal tar products aggregating $6,078,000 during the first three months of 1927 exceeded the imports of $5,464,000 and nearly trebled the amounts shipped during the first three months of 1926. Over two-thirds of the coal tar products exported was comprised of crudes. Benzol, totaling over $2,073,000 (7,763,000 gallons) made up one third of all coal tar products exported with three countries purchasing almost the entire amount, England having taken approximately one-half, and the Netherlands and Germany one quarter each. Almost another one third was accounted for with $1,892,000 (374,000 barrels) of crude coal tar and pitch, 70 per cent of which was sold to French, 11 per cent to Belgian, and 9 per cent to English purchasers, with small amounts distributed among many other countries. On the other hand, the imports of crudes of which creosote oil is the most important, dropped 7 per cent to $2,450,000 (16,691,000 gallons). England is the largest supplier of this commodity.

Fifteen per cent less sulfur left the United States for foreign countries the current quarter than in the corresponding period of 1926.

Both exports and imports of pigments, paints and varnishes gained 2 per cent during January-March 1927, compared with January-March 1926, the former equaling $4,861,000, being five times the imports of $920,000.

Considerably less quantities of calcium cyanamide, tankage, ammonium sulfate, all other nitrogenous fertilizers, muriate of potash, sulfate of potash, kainite, manure salts, other potash bearing substances, were imported with the only kinds entering in larger amounts having been calcium nitrate with $372,000 (8,200 tons); ammonium sulfate nitrate with $383,000 (5,800 tons); dried blood, bone phosphates $334,400 (12,000 tons) other phosphate materials including acid phosphates $215,200 (15,200 tons); and all other fertilizers $279,000 (15,900 tons). The expansion of the acid phosphate group was due principally to entries into Porto Rico of shipments originating in the Cuban plant of an American company.

CHEMICAL RUMOR DENIED

Rumor that General Chemical Co. planned to consolidate its plants at Marcus Hook, Pa., is flatly denied by the company. The report appeared in a daily newspaper as coming from Philadelphia and said in part:

"Plants formerly at Dundee, Bayonne and Camden, N. J., and Easton, Pa., have been removed to Marcus Hook. Arrangements are being made to remove the plant at Laurel Hill, N. Y. Construction of the building to accomodate this plant, which manufactures potash, ammonia and alum, is practically completed and operation will begin within two months.

The company manufactures 400 chemicals and is the largest producer of sulfuric acid in the world. At present the plant covers thirty acres and employs 750 men. The consolidation is expected to add 250 men.

The report was credited to Philadelphia Chamber of Commerce and G. L. Ecott, general manager of Marcus Hook plant.

A. E. Staley Mfg. Co., Decatur, Ill., has postponed building a proposed office building, a slump in the sugar and glucose sales having occurred in the first quarter of 1927. Starch department is operating at usual level. Work is continued in new elevator with capacity for 3,000,000 bushels of grain. It will be completed about July.

Gov. C. C. Young, California, has signed a measure passed by the Legislature, providing for regulation and licensing of dealers handling commercial fertilizers.

1926 COKE OUTPUT

Production of by-products coke in 1926 set a new record, and the combined tonnages of beehive and by-product nearly equaled the high marks of 1918 and 1923. The total by-product output was 44,550,000 net tons, an increase of 12% over the total for 1925, says National Association of Purchasing Agents.

Allowing for imports and exports indicated consumption of coke in 1926 was 55,323,000 tons. Approximately 42,500,000 tons of this total was consumed by blast furnaces. Although blast furnaces still take by far the largest percentage of coke, other markets are rapidly developing, for 23% of the annual output was consumed outside of blast furnaces in 1926.

D. A. Miller, secretary John H. Haerry & Associates, plant managers, consulting chemical engineers to the textile industries, Palisade, N. J., has left for Mexico to conclude negotiations for building a knitting mill with bleach, dye and finishing plant. The enterprise will be financed by English and Mexican Capital. Mr. Miller will make Mexico his future home, as he first will supervise the erection of the mill and the installation of machinery, and later will represent John H. Haerry & Associates as resident manager.

Harry W. Cole, secretary Insecticide and Disinfectant Manufacturers' Association, has sent final appeals to members to attend the Chicago convention of the association which meets next week. He says: "More than 75% of our active, associate and honorary members have signified their intention to be present. We also expect a fairly large number of manufacturers and distributors from points in the middle west to be with us as visitors."

Kauri Gum Control Board of New Zealand has established charges on all gum exported after May 1, states a cable from Consul General Will B. Lowrie, Wellington. The levy is placed at 15 shilling per 100 pounds sterling of the current f. o. b. export value during the period May 1, to Oct. 31, inclusive. After Nov. 1, the levy is to be one and one half per cent of the export value of the gum.

MUST REDENATURE ALCOHOL

(*Special to* CHEMICAL MARKETS)

Washington, D. C., May 11—Prohibition administrators have been notified by Roy A. Haynes, acting commissioner of prohibition of the rescinding of completely denatured alcohol under formulas 2, 3, 4, 6 and 7 to be redenatured. He says in part:

It has been ascertained that completely denatured alcohol, Formulas 2, 3, 4, 6, and 7, which formulas have now been rescinded, is not sufficiently denatured to prevent redistillation and recovery for beverage purposes, and it is hereby directed that all completely denatured alcohol of these formulas in quantities of one drum or more, wherever stored, and by whomever possessed, must prior to the sale or disposition thereof, be further treated by the addition thereto of three-fourths of a gallon of approved aldehol of denaturing grade to each one hundred gallons of alcohol or three eighths of a gallon to each fifty-gallon drum."

CHEMICAL EQUIPMENT EXHIBIT

American Chemical Society will hold its 74th meeting in Detroit September 5—10. It is estimated that from 2500 to 3000 members will attend. An exhibit of equipment for chemical industries and laboratories will probably be made. Present plans are to permit the exhibitors to unpack Sept. 5 and pack up Sept. 9, leaving Sept. 6, 7 and 8 for exhibition. During these three days all of the American Chemical Society meetings will be held in Masonic Temple with entrance only through the exhibition hall.

Stephen T. Mather, Director of National Park Service, and president of Sterling Borax and Brighton Chemical Co., arrived at San Francisco late in April from a trip to the Hawaiian Islands, where he attended the Pan-American Conference.

Utah-Apex Mining Co., Bingham, Utah, will instal a new unit at its selective flotation mill, to be equipped for the recovery of iron concentrates. The expansion is reported to cost in excess of $250,000. R. F. Haffenreffer is president.

COTTON OIL FUTURES

The following market letter by W. A. Storts of Edward Flash Co. is a resume of the cottonseed oil position during April.

The Census report, covering March cottonseed statistics, released April 13th (several days earlier than usual), surprised everyone, in showing March seed receipts 357,000 tons, making total receipts (eight months) ending March 31st, 6,110,000 tons. After April 1st last season, about 190,000 tons were received. Surely receipts for remaining four months this season will run heavier, and it is barely possible that the total will equal 6½c million tons by July 31, 1927, depending, of course, upon replanting necessity.

Refined oil consumption, 322,000 bbls., for March, about equalled expectations, but the "visible", April 1st, seed crude and refined 1,952,000 bbls. 400 lbs. each of refined oil, the heaviest on record for any April 1st, substantiated the fact that there is more than ample supply for all needs, and, unless consumption greatly improves, the carryover, August 1st, into new season will amount to about one million barrels, and such a carryover will become burdensome under normal conditions.

The flood situation in Mississippi Valley is now very serious, and, under that influence, prices have stiffened somewhat. If the flood condition should eventually produce a bullish situation, certainly an advance now is premature and entirely unwarranted, on account of present slow demand and very heavy stocks, deliveries are expected for May.

Tomorrow, April 28th, is the first tender day for May oil, and heavy Circulation of notices will undoubtedly cause severe liquidation from those who did not transfer to later deliveries at much smaller carrying costs, when it was possible to do so.

The pressure from heavy stocks of old oil has caused September/October deliveries to assume a stiff premium, in comparison with July/August, and, barring the unexpected, this premium will probably increase as season progresses. While expecting frequent fluctuations, we also expect, for some time, a steady to sagging tendency in prices, with continued easiness, and, on basis normal developments during the next sixty days, 8½c for July "futures" here seems quite likely.

[The Industry's Finances]

HERCULES POWDER CO. DIVIDEND $3.42

First Quarter of 1927 Shows Gain on Corresponding Period During 1926—Virginia Carolina Dividend of 1¾%—Freeport Texas Assets Increase—Celanese Corp. of America Stock Split Up

Hercules Powder Co. reports for quarter ended March 31, 1927, net profit $700,811 after depreciation and Federal taxes, equivalent after preferred dividends to $3.42 a share earned on 147,000 shares of common stock. This compares with $667,408 or $3.36 a share on 143,000 shares in first quarter of 1926.

Stocks of Celanese Corp. of America has been split up four-for-one, according to an announcement made to the New York Curb Market, which told of the change in name and applied for admission to the list of 880,000 share. The Curb ruled that old stock certificates stamped with the corporation's new name will constitute good delivery, and admitted the shares.

Western Plywoods Co., Reno, Nev., has absorbed Plywoods Products Co., Martinez, Cal., and has filed articles of incorporation with capital stock $500,000. Directors are T. L. Smith, H. H. Melay, T. Ferrari, W. McElroy and E. Armstrong.

J. H. R. Products Co., Willoughby, O., has filed a complaint with Interstate Commerce Commission against Baltimore & Ohio Railroad in which the Commission is asked to require the application of reasonable rates on barium carbonate, from Baltimore to Willoughby. Reparation is claimed.

Virgina Carolina Chemical Co. has declared quarterly dividend of 1¾ per cent on prior preferred stock, payable June 1 to stock holders of record May 17.

United Dyewood Corp. directors were re-elected at the annual meeting of stock holders, at Wilmington, Del.

German imports of coal tar dyes have reached an unprecedented height; in 1926 imports were 3.600 tons valued at 17,364,000, marks. (mark—$0.2370). In pre-war times Germany exported 85 per cent of production, today 66 2-3 per cent are exported from a production of 56,000 tons compared with 129,000 tons pre-war production.

Production of ammonium sulfate in the Union of South Africa during 1926 aggregated 1,004 tons, all of which was produced in the Province of Natal. In fact 91 per cent was produced by one company, The Dundee Coal Co., (Ltd.) Waschbank.

Hinde & Dauch Paper Co. is occupying its new office building at Sandusky, O. Sidney Frohman is president. Frohman Chemical Co. is in the same building.

George Eastman of Rochester, N. Y., head of Eastman Kodak Co., has given $1,500,000 to establish a dental, tonsil and adenoid clinic in London,

Rhodia Chemical Co. have taken over the seventh floor of 21 Spruce st. in addition to the eighth and ninth floors previously occupied.

Ohio Bronze Powder Co., Cleveland, will rebuild the portion of its plant destroyed by fire, April 5, with loss reported close to $100,000, including equipment.

Bayless Pulp and Paper Co., Binghampton, N. Y., has reduced its capitalization from $2,650,000 to $838,800.

Freeport Texas Co.'s consolidated balance sheet as of Feb. 28, 1927, shows current assets of $7,527,139, compared with $7,107,895, on Nov. 30, 1926, and current liabilities of $504,858, compared with $949,326, leaving net working capital of $7,022,281, against $6,158,569.

[Foreign Exchange]

	Par	Current
Great Britain (pound sterling)	4.866	4.855
France (franc)	.193	.039
Italy (lira)	.193	.052
Belgium (franc)	.198	.139
Czechoslovakia (crown) per 100	20.30	2.96
Denmark (krone)	.268	.267
Germany (mark)	.238	.237
Holland (florin)	.402	.400
Poland (zloty)	.193	.025
Norway (krone)	.258	.258
Spain (peseta)	.193	.176
Sweden (krone)	.268	.267
Switzerland (franc)	.193	.192
Argentina (peso)	.414	.423
Brazil (milreis)	.324	.118
Japan (yen)	.499	.474
India (rupee)	.485	.361
China (Silver dollar, Hongkong)	.789	.499
(Tael—Peking, silver)	1.146	.660
(Tael—Shanghai, silver)	1.986	.623

MANGANESE IN COLORADO

Manganese ore has been discovered on Denver & Rio Grande Western railroad in central Colorado, according to "Denver Post", which says: "The vein was reported to be fourteen feet wide and of a proven length of 8,000 feet and depth of 300 feet. Tests on 50 pound samples showed 52.86 per cent manganese, the richest known grade in the world. High grade Caucasian ores test 49 per cent, while Brazilian lodes grade 42. Engineers estimated at least 6,000,000 tons of ore was available, worth at present prices $18,000,000.

Sales of black blasting powder, permissible explosives, and other high explosives in the United States in March 1927 were smaller in volume than in March a year ago, according to manufacturers' reports to the Bureau of Mines. The explosives sold in March included 420,100 kegs (10,502,500 pounds) of black blasting powder, 5,356,000 pounds of permissible explosives, and 24,824,000 pounds of high explosives other than permissible.

French Chamber of Deputies, has adopted a bill relative the Alsatian potash mines, and the Senate Committee on Finances is considering it. This bill would authorize the leasing of the mines for 75 years to a stock company in which the workers would participate.

Phosphate rock sold by producers in the Unitel States in 1926 was 3,209,976 long tons, valued at $10,893,800, according to Bureau of Mines. The figures indicate a decrease of 8 per cent in quantity and of 6 per cent in value compared with 1925.

J. H. Igel has been transferred to the Eastern Sales Branch of Monsanto Chemical Works, 12 Platt st., New York. He was formerly at the home office, in St. Louis.

[Stocks & Bonds]

	1926 High	1926 Low	1927 High	1927 Low	Current Bid	Current Asked	Ann. Div
*Air Reduction	146¾	107½	164	134½	158	159	6
*Allied Chem.	148⅞	106	146¾	131	138⅝	139	6
*Allied Chem. pfd.	122¾	118¾	122	120	121¼	121½	7
Am. Ag. Chem.	34⅜	9	14¾	8⅛	10¼	11	
*Am. Ag. Chem. pfd.	9 0⅛	35⅝	51¾	28¾	34½	36	
*Am. Can.	63½	38⅞	50¾	43⅝	48¾	48½	2
*Am. Can. pfd.	130⅛	121	132	126	128	129	7
*Am. Cyan "A"	46	36⅞	40	32	27	37	
*Am. Cyan. "B"	47	35¼	35	32	27	29½	
*Am. Linseed	52⅞	25⅝	30½	20¾	25	25⅜	
*Am Linseed pfd.	87	68¾	71⅛	46⅜	57	58	7
*Am Metals	57⅜	42¼	44	40⅞	42	42¼	3
*Am. Metals pfd.	120	113½	112	107	110½	111	7
Am. Rayon Prod.	35¾	29¾	9¾	3½	5¾	5⅞	
*Am. Smelting	152	109⅝	153½	132⅝	149	149½	8
*Am. Smelting pfd.	122⅜	112⅞	126⅞	119¼	126	126½	7
*Am. Zinc	12¾	5½	10¾	7½	7½	7¾	
*Am. Zinc pfd.	54½	20	51¾	42	46⅛	47	
Anglo Chil. Nitrate	101	97½	100⅛	95¼	95½	...	
*Archer-Dan-Mid.	38⅞	36	42	38	41	42	3
*Archer-Dan-Mid. pfd.	108	100	108	106	107	108	7
*Armour Del pfd.	97⅞	90¼	96⅛	86	86	87	7
*Atlas Powder	64	54	62½	5 0½	59¾	60	4
*Atlas Powder pfd.	97⅞	96	105	98	103	105	6
*Brooklin Un Gas	98	68	104½	89⅞	103	103⅜	4
*By-Products Co.	93	53	86	66	80	81½	2
*By-Products Co. pfd.	...	...	115	105	110	115	9
*Calla L & Z	2⅝	1½	2⅝	1¼	1⅝	1¾	2
Canad. Ind.	30	16¼	27	14	26	26⅝	
Canad. Salt	145	131	115	105	105	115	1
Casein Co.	...	...	176	149	167	172	6
Celluloid Corp.	26	16	22	16	20	22	
Celluloid Corp. pfd.	68	55	73	63	70	72	
*Certainteed Prod.	49½	36⅛	52¼	42	50⅞	51	4
Charcoal Iron	33½	24	20	8	10	20	
Chesebro Mfg. Co.	78	65	78	73	75¼	78	
Clark Co. Fred	5	2¾	4	2	2½	4	
Cleve Chff Iron	75	69¼	75	69	70	75	
*Columb Carbon	70¾	55⅝	85½	66⅞	75	76	4
*Com. Sol. B	237	118¼	357¾	223	343½	344	8
*Cont. Can	92¼	70	73½	58¾	65	65¼	5
*Cont. Can pfd.	126	117½	125	120	124¾	125	7
*Corn Prod.	51⅜	35⅝	62⅜	46⅞	60⅛	60¼	2¼
*Corn Prod Pfd.	130¼	122½	131	128	129	130½	7
*Davison Chem.	46¾	27½	32¾	26½	27	27⅜	
*Davison Chem. Pfd.	...	...	43½	43	43½	43½	
*Devoe & Rayn A	104⅛	31	42⅜	37¾	39	40	2.40
*Devoe & Rayn B	105	40	107	103	102½	104	
*DuPont deb.	110¼	100¾	112	105½	111½	112	6
*DuPont de Nem.	181½	157	253⅞	168	243½	244	8
*Eastman Kodak	136¾	106⅝	147½	126¼	142½	143	8
*Freeport Texas	36	19⅝	74¾	34	66½	66¾	4%
*Gen. Asphalt	94¼	50	96¾	72½	75½	76	
*Gen. Asphalt pfd.	120	94⅞	144⅞	113	116¾	120	5
*Glidden	25¾	15⅜	23	18½	20	20¼	2
*Gold Dust	56½	41½	54	42	52¾	53	
Grasselli	145	120	130	125	125	130	8
Grasselli, pfd.	103½	102	103	100	101	103	6
Hercules Powd. pfd.	115	110	119	115	117	118½	7
*Household Prod.	48⅜	40	50¾	43¼	48½	49	3½
Industrial Rayon	19⅞	10½	8½	4½	6¾	7	
*Int Agr.	26¾	9⅝	10¾	6⅛	6	7¼	
*Intl. Agr. pfd.	95	57	65	33	34	34½	
*Intl. Nickel	46¼	32⅜	60⅝	38¾	57⅞	58	2
Intl. Salt	84⅛	61½	72	65	65	68	6
MacAnd & Forbes	46¼	40	43½	40	42	43	
*Mathieson Alk.	106⅛	62½	109⅝	82	103	104¼	4
*Mathieson Alk. pfd.	105	100	107½	103	109	110	7
Merck & Co.	...	...	86	65	77½	79½	4%
Merrimac	83	72	80	73	75	80	10
*Natl. Dist.	34	12½	27½	17	24¾	24½	
*Natl. Dist. pfd.	73½	57	52½	43½	47	47⅛	
*Natl. Lead	181	138	200	160	194	195	10½
*Natl. Lead pfd.	120	116	130	117¼	129½	129⅞	7
N. J. Zinc	214½	180	206	202	203	206	
Niag. A pfd.	...	...	...	...	80	85	
*Owens Bottle	99¾	53¾	84½	75⅛	79	80	5
Penn Salt	91	71	77	74	76	77	5
*Peoples Gas Chi.	131	117	141	126	139	140	8
Proc. & Gam.	163	142½	159	157	159	...	
Royal Bak Pdr	213	190	179	161	1 8	173	8
Royal Bak Pdr pfd.	105½	102	104	99	101	102½	6
Shawinigan	191	167½	170	168	170	...	
*Sherwin-Williams	108	108	109	105⅞	105	108	
*St. Joseph Lead	48½	36⅝	43⅞	39	39	39¾	3
Silica Gel.	22¾	11⅞	19	13⅛	15	...	
Swan & Finch pfd.	...	...	30	20	20	30	
*Swift & Co.	110	110	120¾	116	115½	115⅞	8
*Tenn C & C	16	10⅞	13¾	10⅝	11⅝	12	1
*Texas Gulf & S	142	119½	175½	173	175	175½	10
*Union Carbide	100¼	78	122⅓	98¼	118	118⅞	6
*United Dye pfd.	58	58	49	38¼	42	44	7
Un Gas Imp.	144½	84¼	108	106	106½	108	
*U. S. Gypsum	166	126	110	107	107½	110	
*U. S. Ind. Al.	84½	45⅜	89	69	75¼	75½	5
*U. S. Ind. Al. pfd.	114⅞	90¼	110¾	107¼	107¼	108	7
*Va Car 6% w i	69	31⅜	36¾	26⅜	27	28	6
Will & Baumer	...	...	16½	15	16½	...	

CHINAWOOD OIL PRICES

Wood oil exports from Hankow, China, during April totalled 35,245 barrels, (13,569,325 pounds), 28,258 barrels (10,917,830 pounds, of which were shipped to United States, and 6,887 barrels (2,651,495 pounds) to Europe, according to a cable from Consul General Frank P. Lockhart, Hankow. Hankow stocks at the end of April are estimated at 350 tons. No reliable information is obtainable regarding Wanhsien or Changteh stocks.

Market opened April 1 at 35 taels per picul ($0.166 per pound) for immediate delivery, increasing to 36 taels ($.172 per pound) and jumping to 38 taels ($0.182 per pound) April 2. From the third to the seventh the market was practically closed because of disturbances. Small offers of spot for 36 taels ($0.174 per pound) were made on the 7th declining to 35 taels ($0.166 per pound) on the 9th and 34.50 taels ($0.165 per pound) on the 11th, remaining at that point until the 15th when the price increased to 36 taels ($0.16 and $0.17 per pound) until the 28th, when a weakening tendency began and the price at the end of the month lowered to 33 taels ($0.156 per pound.

Receipts for the month were reported below needs, but oil is coming in by junks from up-river. Tankers are unable to leave for down-river shipments because of insufficient convoys through the war zone. As the Yangtze has risen, ocean steamer sailings have been resumed by some German lines. It is extremely difficult to predict the market trend on account of existing factors which are subject to quick change such as transportation facilities and embargo, the cable states.

C. J. Peterson, Examiner, Interstate Commerce Commission in a proposed decision which he has prepared for the Commission did not find unreasonable the rate on phosphate rock, in carloads, from Nichols, Prairie, and Morris Mine, Fla., to Macon, Ga. and he recommends that the complaint be dismissed. This proposed decision is in the case of Cotton States Fertilizer against Atlanta, Birmingham, & Atlantic Railway Co.

Anaconda Copper Co. will erect an electrolytic zinc plant at Anaconda. It will be about one-half capacity of plant at Great Falls.

[Industrial Chemicals]

STRENGTH IN COPPER SULFATE FEATURES MARKET

Copper Sulfate Moving Very Well—Alcohol In Demand and Firm—New Orleans Plants Said to Have Ceased Operations Temporarily—Domestic Makers of Ammonium Chloride Meeting Imported Competition—Mercury Unchanged and Firm—Lead Acetate, Red Lead and Litharge Down.

Advanced

Cream of Tartar, dom., ½c lb.
Naphthalene, flakes & Balls, ½c lb.

Declined

Lead Acetate, all grades 1c lb.
Lead, Red, ½c lb.
Litharge, ¾c lb.

Trend of the Market

	Today	Two Weeks Ago	Last Month	Last Year	War Peak	Pre-War
Acetic Acid, Glacial, c-l....lb	.11⅞	.11⅞	.11⅞	.11½	.19½	...
Sulfuric Acid, Tanks 66° ..ton	15.00	15.00	15.00	14.00	55.00	20.00
Amm. Sulfate c-l NY...100lbs.	2.40	2.50	2.50	2.65	7.50	2.65
Bleaching Powder, c-l ..100lbs	2.00	2.00	2.00	2.00	9.50	1.50
Copper Sulfate c-l NY..100lbs	4.95	4.75	4.75	4.65	20.00	4.60
Potash Caustic c-l Imp. ....lb	.07½	.07½	.07½	.07½	.37	.06
Soda Ash, 58 p.c. c-l ..100lbs	1.94	1.94	1.94	1.94	3.50	.60
Caustic Soda, 76 p.c. c-l 100lbs	3.66	3.66	3.66	3.66	9.50	1.42
Potassium Bichromate .....lb	.08¼	.08¼	.08¼	.08¼	4.65	.06
Sodium Prussiate .....lb	.12	.12	.11	.10	1.25	.18
Average	3.023	3.013	3.012	2.927	10.79	2.99

Current Quotations and Comments on Specific Items, Pages 726-736

Continued strength in copper sulfate and denatured alcohol and the easiness of the domestic ammonium chloride markets were of prime interest during the past week in the industrial chemical field.

Factors report a very good business in copper sulfate both in carlot and less carlot quantities and the market is holding very firm at the openly quoted levels, with sellers getting as high as $5.25 100 lbs. for small quantities. The alcohol position is much the same and if possible is a little more acute than was the case last week when a 2½c gal. advance was reported. It is now a definitely established fact that the producing units in the New Orleans territory will be crippled to some extent by the flood.

Domestic producers of white and gray ammonium chloride are meeting imported competition on both grades. White is moving fairly well, while gray is routine at the moment. Red lead and litharge have again been reduced by leading makers following lower lead markets. Demand for these items is rather slow for this season of the year. Lead acetate has been reduced on lower raw material costs.

Mercury is about marking time at the level which has prevailed for the past two weeks with consuming interest still good. but with routine sales. The market is still quite firm here and there is no indication from abroad as yet of lower replacements.

Otherwise manufacturers report a satisfactory movement of various heavy chemicals which are sold on a contract basis, with consumers taking delivery of their committments as scheduled.

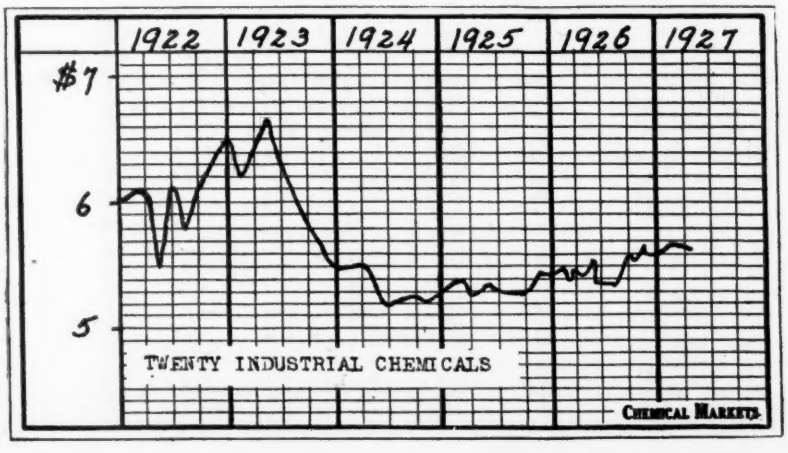
Production of aluminum salts in 1926 was 373,695 short tons, valued at $13,202,010, compared with 335-480 tons, valued at $13,155,790, in 1925 Aluminum salts industry consumed 114,570 long tons of bauxite in 1926 compared with 122,340 tons in 1925. Bauxite consumed in 1926 was 65 per cent from domestic deposits and 35 per cent imported ore. There was also consumed 200 tons of aluminum metal (used in the manufacture of alumina hydrate), 3.800 tons of aluminum hydrate.

HAMBURG CHEMICAL PRICES

(Special to CHEMICAL MARKETS*)*

Hamburg, Germany, May 2—Business in heavy chemicals which was interrupted during the Easter holidays has improved; the market however is showing its former dull tendency and business remains small in almost all lines. Permanganate of potash has reached lower levels. Blue vitriol has advanced; also oxalic acid. The following prices are f. o. b. Hamburg; those in Dollars per 100 Kilos, and those per 1000 Kilos in pound Sterling. Caustic potash $13.75; caustic soda, £12.15s; sulfate of alumina commercial 14 to 15%, £4.12s 6d; sulfate of alumina commercial, 17 to 18%, £5.12s. 6d; hyposulfite of soda, commercial large cryst. £7.17s. 6d; barium carbonate 98/100% precepitated $3.45; barium chloride 98/100% cryst., $3.70; epsom salts, commercial cryst. in double bags £2.3s—; borax, powdered, £19.2s. 6d; ammonium bromide, $82; potassium bromide, $70; sodium bromide 74; calcium chloride 70 to 75% fused, £3.3; glauber salts small cryst. commercial in bags, $1; carbonate of ammonia lumps, £30; potash alum granular, £6.17s. 6d; chlorate of potash $11.25; permanganate of potash, £37; blue vitriol £22.15; potash, carbonate of calcined, ground, 96 to 98%, £23; sal ammoniac white granular 98/100% $8; sodium sulfide 60 to 62%, fused, £ 8.17s. 6d; cream of tartar $37; oxalic acid £24.10; tartaric acid $58.60.

N. C. Polson, jr., head of the chemical firm of that name, has been nominated as chairman of Montreal branch of Canadian Manufacturers' Association for next year.



[Crudes & Intermediates]

BENZENE REMAINS WEAK AND TOLUENE STRONG

Weak Gasoline Market and the Greater Recovery of Toluene Are Depressing Prices—Toluene Very Firm and in Strong Position—Xylene and Solvent Naphtha Soft—Phenol Competitive—Naphthalene Firm—Intermediates Quiet but Steady in Price

Advanced: No Advances. Declined: no declines

	Trend of the Market: Today	Two Weeks Ago	Last Month	Last Year	War Peak	Pre-War
Benzene, pure tanks wks ...gal	.23	.23	.23	25	1.10	.25
Naphthalene flake .....lb	.04½	.04½	.04½	.05¾	.16	.03
Phenol Spot .....lb	.17	.17	.17	.22	1.50	.08
Toluene tanks wks .....gal	.35	.35	.35	.35		
Aniline Oil le-l	.15	.15	.15	.16	1.40	.10½
Alpha-naphthylamine .....lb	.35	.35	.35	.35	1.28	—
Benzaldehyde .....lb	.70	.70	.70	.70	—	—
Betanaphthol bbls .....lb	.24	.24	.24	.24	1.50	.08
Dimethylaniline e-l	.32	.32	.32	.30	1.30	.
Paranitroaniline bbls. .....lb	.52	.52	.52	.47	1.58	.18
Average	3.08	3.08	3.08	0.310		

Current Quotations and Comments on Specific Items, Pages 726-736

Weakness in the market for benzene and strength in toluene continue to feature the market for light oil distillates. The heavy demand for toluene is causing producers to strip greater volumes of motor benzene of its toluene and this makes more solvent naphtha and xylene as well as more pure benzene. It likewise makes less 90 per cent benzene. With the weak gasoline market and the fact that gasoline blends are gradually being replaced by other anti-knock fuels, motor benzene is not commanding a very high price. The fact that large quantities of motor benzene are being converted into pure benzene to recover the toluene, makes the price differential between motor benzene and pure benzene appear very wide, as plenty of pure benzene is sold as motor benzene. Some factors quote an open price of 24c gallon in tankcars, for benzene but there is no definite price. Material is moving freely at 22c@23c gallon and even this price has been shaded. Prices on toluene are very firm and the market is in a very strong position. Solvent naphtha and xylene are seeking outlets at 35c gallon in tankcars and these prices will be shaded in some quarters for firm orders of tankcar quantities.

Phenol is fairly steady at the recent reduction to 16c lb. for 250 lb. drums. Production capacity still exceeds consumption by a large amount and this market is constantly declining. Naphthalene is very firm with an active seasonal demand. Cresylic acid is particularly strong due to an increased demand for disinfectant purposes.

Intermediates are holding at unchanged prices without exception. Manufacturers state that demand is of routine character but the volume is steady. The continued price competition in dyes is not being reflected in intermediates to any appreciable extent. The makers of the commonly used colors are still cutting prices sharply in an effort to increase their volume of business, but thus far all makers are meeting practically every reduction.

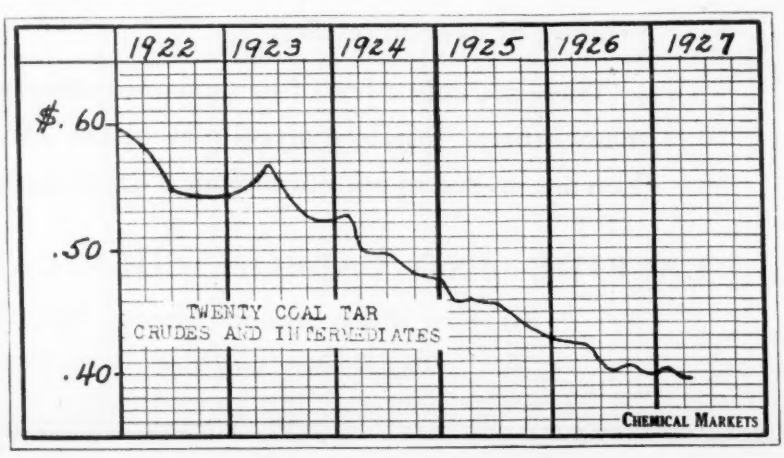
Imports of benzol into England for the week ended March 28 were 1,657,906 gallons of which 750,000 gallons were from United States, according to British statistics published April 2.

GREEN AND BLUE DYES

National Aniline & Chemical Co. draws attention of textile manufacturers and other dye consumers to a new National chrome green and National Erie fast rubine B. conc. saying. National Alizarine cyanone Green G Extra is an Acid Alizarine Green of bluish tone, characterized by all-round fastness and its suitability for use as an acid as well as a chrome dye. It may be applied by all three methods commonly employed for mordant dyes, producing tones slightly duller than the self shade, but of better fastness to washing, potting and milling. It dyes well in a neutral bath, staining cotton but very slightly, and dyeing wool and silk practically the same shade and strength. National Alizarine Cyanone Green G Extra is suitable for wool in all forms, including vigoreux printing, and is particularly recommended for shading National acid, chrome, and nacco dyes. Excellent fastness to light adapts it for application to carpet and upholstery yarns.

National Erie fast rubine B conc. possesses properties similar to, but produces much bluer tones than National Erie Fast Scarlet 8BA. Excellent solubility and inertness to metals adapt it for application in all types of machines. National Erie Fast Rubine B Conc. is particularly recommended for unions, dyeing the cotton almost to the exclusion of the animal fibres; in a soap-soda ash bath silk is left entirely unstained. This product will be of special interest to the printing trade on account of its excellent dischargeability with hydrosulfite.

Gossett Dyeing & Finishing Co., Anderson, S. C., are building a plant to cost $150,000. Operation will begin Aug. 1.



Oils and Fats

CHINAWOOD OIL LOWER ON OTHERWISE QUIET MARKET

Position on The Coast Sharply Lower—Spot Also Down—Cottonseed Unchanged With Easy Undertone—Linseed Up and Demand Improving—Olive Oil Quiet But Steady—Perilla Oil Still Up—Crude Cottonseed Advances—Market Dull.

Advanced

Cottonseed Oil, P. S. Y. spot 0.5c lb.
Cottonseed Oil, crude, Texas, ½c lb.
Cottonseed Oil, crude, Valley & Southwest, ¼c lb.
Linseed Oil spot 0.7c lb.

Declined

Chinawood Oil, spot bbls. 1c lb.
Chinawood Oil, Coast tanks 3c lb.
Olive Oil Foots, spot ¼c lb.
Perilla Oil, tanks Coast, ¼c lb.

Lard No. 1	gal	.77	.77	.77	.86	2.90	.92
Neatsfoot 20° ct	gal	1.06¾	1.06¾	1.10¼	1.31	8.45	.95
Red Oil distilled	lb	.09½	.09½	.09¾	.10	.17	.07
Stearic Acid T. P.	lb	.13¾	.13¾	.13¾	.16¼	.38	.12
Coconut Ceylon tanks	lb	.08	.08	.08¼	.10	.30	.14
Cottonseed, crude tanks	lb	.07¾	.07½	.07¾	.12	.25	.08
Linseed crude c-l bbls.	gal	.84	.78¾	.78¾	.81	1.85	.57
Olive, denatured	gal	1.65	1.70	1.60	1.15	4.60	1.05
Peanut refined	lb	.16¼	.15½	.15½	.15	.30	.08
Soya Beans bbls.	lb	.12	.12	.12	.12¾	.19¼	.07
Average		4.87	4.87	4.87	4.67	5.92	1.50

Current Quotations and Comments on Specific Items, Pages 736-738

Again last week the local oil market was rather dull with no movements in any direction which were not anticipated by the trade. A decline in the price of Chinawood oil on the Coast in tanks was probably of primary importance, but it was not surprising because the trade here assumed that a reaction was due. Spot Chinawood oil was also affected to some extent on a dull market with consumers holding off awaiting a further decline.

An advance in linseed oil to over 11c lb. here for the first time in months was also of interest. Crushers were also experiencing a somewhat better demand over the week than was the case previously and this combined with an advance in the Argentine seed market was instrumental in advancing the price. Cottonseed oil which has shown minor fluctuations for the month is in much the same position now as it was in the middle of April. Factors are inclined to discount any possible effect that the flood in the Mississippi valley might have on the cotton oil situation. Crude cotton oil is somewhat firmer having advanced almost ½c lb. over the week. Perilla oil continues to hold at its high level, the decline in Chinawood having had no effect on the spot position as yet.

Denatured olive oil and foots are holding fairly steady on this market, though inquiry on spot continues routine. However, when buyers come in the market they are forced to pay the openly quoted prices. Red oil and stearic acid are moving fairly well at the present levels, though the market is none too strong.

Castor, coconut and corn oils are all in about the same position as when last reported. Animal oils and fats are in average demand with the markets showing only minor fluctuations.

National advertising and publicity campaign of Linseed Meal Educational Committee whose membership is made up of representatives of linseed crushers, will be handled by Olson & Enzinger, Inc., advertising agency at Milwaukee.

Chicago paint and varnish superintendents recently heard E. M. Oren, publicity manager U. S. Gypsum Co., on plastic paint.

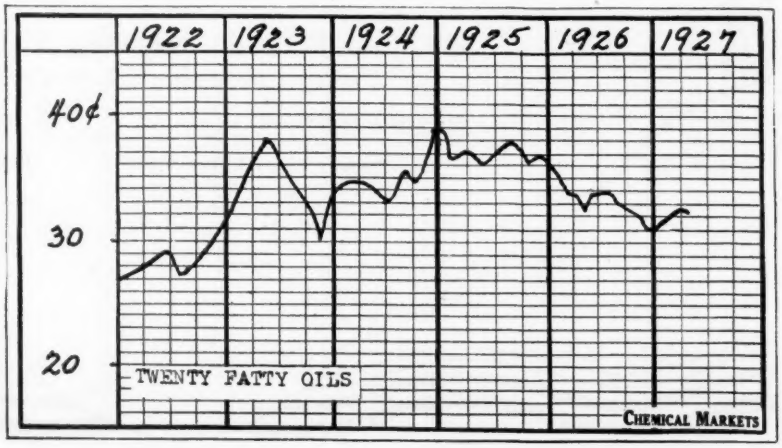
COTTONSEED OIL OUTPUT

Factory production of fats and oils (exclusive of refined oil and derivatives) during the three-month period ended March 31, 1927, was as follows: Vegetable oils, 960,356,900 pounds; fish oils, 9,455,291 pounds; animal fats, 561,429,220 pounds; and grease, 96,330,123 pounds; a total of 1,627,571,534 pounds. Of the several kinds of fats and oils covered by this inquiry, the greatest production, 640,289,910 pounds, appears for cottonseed oil. Next in order is lard with 442,684,328 pounds; linseed oil with 202,162,304 pounds; tallow with 116,709,678 pounds; coconut oil with 72,567,978 pounds; and corn oil with 27,273,591 pounds.

Production of refined oils: Cottonseed 577,830,501 pounds; coconut, 57,188,329 pounds; peanut, 2,124,740 pounds; corn, 22,147,348 pounds; soya-bean, 840,374 pounds; and palm-kernel, 126,130 pounds.

Dr. L. G. Connor and Harry L. Louri, representatives United States Tariff Commission, who have been spending six months in China making a study of methods of control on soya beans, soya bean oil, peanut oil, cotton seed oil and dried eggs, were recent arrivals at San Francisco. They will remain in California several weeks before going to Washington.

Growing resentment on the part of New Zealand farmers at the apparent price control of fertilizer manufacturers in that country has resulted in the formation of an opposition company, Challenge Phosphate Co. of Auckland, which has entered the field with what is said to be strong backing, according to advices from Vice Consul J. C. Hudson, Wellington.



[Agricultural Chemicals]

NEW POTASH PRICES ON PAR WITH FORMER QUOTATIONS

Announced Schedule Comes At Time of Acute Shortage Here—Sulfate of Ammonia Lower—Nitrate of Soda Quiet in This Territory—Little Interest Yet for New Season—Blood and Tankage Steady and Quiet—Insecticides Moving Regularly.

Advanced Copper Sulfate, 15c—100 lb. **Declined** Ammonium Sulfate 5c—100 lb.

Trend of the Market

	Today	Two Weeks Ago	Last Month	Last Year	War Peak	Pre-War
Acid Sulfuric 66°.....ton	$15.00	$15.00	$15.00	$14.00	$55.00	$20.00
Amm. Sulfate .....100 lbs	2.40	2.45	2.50	2.65	1.75	2.65
Arsenic .....100 lbs	3.75	3.75	3.50	3.50	18.00	4.00
Copper Sulfate c-1 ....100 lbs	4.95	4.75	4.75	4.65	20.00	4.60
Paris Green	19	.19	.19	.19	.50	.11
Potash Muriate 80%.....ton	36.40	36.40	36.40	34.90	...	...
Potash Sulfate 90%.....ton	47.30	47.30	47.30	45.85	440.00	48.07
Phosphate Acid 16%.....ton	10.00	10.00	10.00	10.00	11.00	3.00
Phosphate Rock 68% .....ton	3.00	3.00	3.00	3.25	2.65	3.00
Sodium Nitrate .....100 lbs	2.60	2.65	2.67	2.63	5.00	1.90
Average	12.550	12.550	12.532	11.838	103.50	13.84

Current Quotations and Comments on Specific Items, Pages 726-740

A spot scarcity and much firmer markets on all potash salts was the feature of the local fertilizer market over the week. Otherwise the market was rather quiet as might be expected at the end of the season. With the transfer of the German selling agency here on potash salts a shortage occurred when the old company ceased to order stocks forward sometime previously to the cesession of operations here. In the meanwhile there is little or nothing offered on spot by first hands and the demand is quite brisk.

Producers of sulfate of ammonia have again lowered their price 5c 100 lbs. in all territories. Consuming demand is up to the average but supplies are plentiful and sellers are willing to make this concession to expedite the movement of stocks. Activity in nitrate of soda is practically at a standstill on this market. Importers continue to ask the prices which have prevailed for the past few weeks and with the end of the season at hand consumers prefer to buy only what is absolutely necessary for their immediate requirements, waiting for the new season offers before placing sizeable orders. To date practically nothing has been done in the way of bulk business for July-December delivery at the new schedule.

Blood and tankage have about finished for this season, with both holding firm at the levels of the past few weeks. Bone meal is moving in a routine manner with the imported price well maintained.

Insecticides are moving at a steady gait with no price changes since last reported. Nothing has been heard yet on this years activity on calcium arsenate, but activity may be expected before many weeks have elapsed.

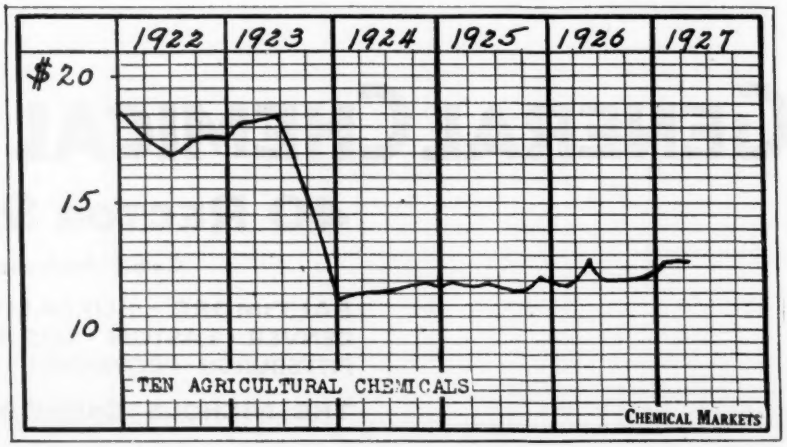
Potash Importing Corp., New York, is maintaining its offices in the Citizens' National Bank Building, Baltimore, but all business is being referred to New York headquarters, and the organization is virtually marking time until foreign potash syndicates determine what course to adopt to avoid a clash with Washington.

FERTILIZER SALES

National Fertilizer Association is sending a bulletin to members saying that tag sales for April were 29 per cent larger than in April, 1926. The bulletin further says:

"Sales in the twelve southern states during five months December-April, were only 85% of the like period of last season. For the nine leading cotton States from North Carolina to Texas (excluding Florida and Missouri) tag sales for December-April were only 82.9% of the like five months of last season and 83.3% of the like period of 1924-5. Since sales for the remainder of the season are relatively small when compared with, the total for the season. the final percentage of sales for the year will not be far above 85% of the previous year.

"For April the States of North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Texas showed increases over April, 1926, but the following States showed smaller sales than for April, 1926: Virgina, Florida, Tennessee, Missouri, Arkansas, and Louisiana. For the five months, December-April, only Florida exceeded the like period of last season. The decreases from last season were: Arkansas, 57% of 1925-6; Texas, 62%; Tennessee, 66%; Louisiana, 73%; Mississippi, 74%; Alabama, 74%; South Carolina, 80%; Missouri, 83%; Georgia, 92%; North Carolina, 94%; and Virginia, 95%. The States that showed the largest declines were those that are accustomed to sow considerable grain and those that were hardest hit by the decline in the price of cotton, such as, Arkansas, Texas, and South Carolina.



[Industrial Raw Materials]

ALL GRADES OF SHELLAC HIGHER ON SPOT.

Importers Advance Price on Short Stocks—Rosin and Turpentine Higher Here on Good Sales But Lower at Savannah—Egg Albumen and Yolk Lower on Routine Interest—Wattle Bark Down—Other Tanning Materials Quiet—Carnauba Wax Higher.

Advanced

Myrobalans J2's ship. $1.50 ton
Rosin B, 40c 280 lb.
Rosin D, 15c 280 lbs.
Rosin E, F, G, 15c 280 lb.
Rosin H, K, 20c 280 lbs.
Shellac, all grades 1½c lb.
Turpentine, spot, ¼c gal.

Declined

Albumen, egg edible 3c lb.
Divi Divi, ship, $1.50 ton
Egg Yolk, spot, 3c lb.

Current Quotations and Comments on Specific Items, Pages 738-740

Further advances in the spot price of all grades of shellac was of prime interest over the past week. Stocks are limited in all quarters, and with a good demand prevailing, the opinion is expressed that a higher market is not unlikely.

Recoveries in the common grades of rosin on spot in spite of heavy receipts at the Southern seaboard ports indicates that there is a healthy demand which might hold the market at current levels in spite of the unusually big crop. Turpentine is also steadier here and the market advanced a fraction of a cent on spot during the week. At the primary markets both rosin and turpentine were also in good demand although the prices showed recessions from the previous week. Carnauba wax is again firm on spot after giving indications of sliding off for the past two weeks.

Egg Albumen and yolk took a downward turn after several months of advances and firm markets. Both are said still to be in limited supply, but buying has fallen off, particularly in albumen and the markets are lower. Wattle bark is sharply lower for shipment with the advent of new crop offers. Other tanning materials are about holding their own on a rather quiet market. Varnish gums are quiet for this season and except for an advance in Batavia damar last week are generally easy. Starches and dextrins are unchanged.

(*Special to* CHEMICAL MARKETS)

Savannah, Ga.,May 9 — Turpentine again shows a decline for the week of about 1c gal. The decline has not been due to a lack of demand, for buyers have been in the market every day for practically the entire receipts at Savannah, but persistent reports of a heavy crop are causing an easy tone to the market. Turpentine at 56c gal. is considered cheap here and while it is admitted that it will probably go lower on this decline, the present time is looked on as a good one to buy. On Saturday last there were sales of 142 bbls. reported at 56½c@56¾c gal. Receipts of Turpentine last week were: 5272 bbls.; sales reported, 1,565 bbls. (private term sales about 3000); shipments, 2386 bbls. and stocks, 12,760 bbls.

Rosins were posted firm and there were sales on Saturday of 1402 bbls. at the open market price. Last week was very active with buyers showing a desire to take on stocks and there was some competition for the parcels offered. Prices during tht coming week may only show slight fluctuations as was the case last week. Prospects of heavy offerings during the succeeding weeks indicate a lower market for a short time, with the probability of a quick recovery when these stocks are off the market. It seems that most dealers and many consumers have orders to buy rosin at about the prevailing levels. Receipts last week were, 16513 bbls.; sales reported, 6863 bbls.; shipments, 19,331 bbls. and stocks, 36,610 bbls. Current quotations are: B, $8.00; D, $8.20; E, $8.40; F, $8.60; G, H, I, $8.85; K, $8.90; M, $9.10; N, $9.40; WG, $10.40; WW, $11.35.

N. H. Weitzner, head of J. H. Nicholas & Co., New York, has returned from a European trip, and will represent a producer of chalk, hereafter, along with other foreign manufacturing interests.

GLYCOL GAINS INTEREST

Ethylene glycol is absorbing a good deal of attention say Parsons & Petit; it has come to be realized that this article provides a real substitute for glycerin and apparently it is now a good deal a matter of price between the two commodities, with a sentimental leaning toward glycerin. There are said to be certain desirable qualities in glycol, which glycerin does not possess, particularly the non-freezing characteristic. It must be considered, however, that the production of glycol is now limited and it is therefore impossible to supply a sufficient quantity to displace glycerin entirely, in the explosives trade. Output can probably be increased, but it is questionable, whether a large investment will be considered wise, in view of the fact that glycerin is a by-product and must be sold, even if the price has to be reduced, much below the present level.

FRENCH NAVAL STORES

Deficit in this year's French naval stores crop is believed in France to be possible according to a cable from Consul Lucien Memminger, Bordeaux. Spot turpentine is quoted in the Landes at 522 francs per kilos ($.65 per gallon, while 290 francs per 100 kilos ($11.98 per 280 pounds) is asked for rosin (WW).

French turpentine and rosin exports during the month of March were 733 and 5,989 metric tons respectively compared with 1,385 metric tons of turpentine and 7,938 metric tons of rosin during the month of February.

Imports into Canada during February of aniline and coal tar dyes were as follows,—From Britain, 11.001 lbs., value $10.015; United States 111.435.; value $68.604; France 4,981.; value $2,707; Germany 51.057 lbs., value $33.005; Switzerland 25.624 lbs., value $17.799; Total 204.100 lbs.,value $132.130 compared with imports during 1926. From Britain, 11.701 lbs., value $6.685; United States 115.830 lbs., value $73.624; France 13.543 lbs., value $4,004; Germany 41.461. value $28.573; Switzerland 23.339 lbs., value $18.654, total 205.874 lbs., valued at $131.585.

John Z. Heizer, sales manager of Buckeye Soda Co. Painesville, O., has been elected vice-president in charge of sales.

[Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted herein are those of American manufacturers for goods, spot New York, f. o. b., or ex-store, for immediate shipment, unless otherwise specified. Industrial chemical products sold principally on a basis of f. o. b. works are specified as such. Quotations on imported chemicals are so designated. Resale stocks sufficient to be a factor in the market, are quoted in addition to makers' prices and are indicated as "second hands."

Oils and fats are quoted spot New York, or ex-dock. Quotations on products sold f. o. b. mills, or spot Pacific Coast are so designated.

Industrial raw materials are quoted spot New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered at various sections of the country are so designated.

The range of prices given is not "bid and asked," but indicates quotations from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used in the New York market.

Chemicals

Acetaldehyde drs., or cyl. c-l wks	lb	...	.22
lc-l wks	lb.	.24	.26
ACETANILID, tech 150 lb bbls	lb	.20	.21
100 lb kegs	lb	.22	.23
Acetic, Anhydride			
85% 100 lb cbys	lb,	.27	.30
92-95% 100 lb cbys	lb	.29	.35
Acetic Ether, see Ethyl Acetate			
Acetine, 50gal drums	lb.	.37	.40
Acetone, CP, 700 lb drs c-l wks	lb	...	.12
Tank cars, wks	lb	...	.12
350 lb drs. lc-l wks	lb	...	.14
700 lb drs., lc-l wks	lb.	.13	.13½
Acetone Oil light drs N. Y.	gal	1.65	1.75
Heavy, drs NY	lb	1.65	1.75
Acetyl Chloride, 100 lb cbys	lb	.42	.45
Acetylentetrabomide	lb	...	1.50
ACID, Acetic, 28% 400 lb bbls c-l wks	100 lb	...	3.38
56% c-l wks	100 lb	...	6.34
70% bbls c-l wks	100 lb	...	7.82
80% com'l bbls c-l wks	100 lb	...	8.77
80% pure bbls c-l wks	100 lb	...	9.75
Glacial bbls c-l wks	100 lb	...	11.92
Glacial USP cby wks	10 lb	...	12.65
Lc-l 25c 100 lbs differential			
Anthranilic, tech., drs	lb	...	.80
99-100% 100 lb drs	lb	.98	1.00
Benzoic, tech., 100 lb bbls	lb	.57	.60
Boric crys., powd., 250 lb bbls	lb	.08½	.11
Kegs 100 lb	lb	.09½	.12
Carbolic, crys., see Phenol			
Crude 35% 50gal bbls	gal	.31	.33
10% 50gal bbls		.25	.28
Carbonic, see Carbon dioxide			
Chloracetic			
Mono 100 lb bbls wsk	lb	...	.25
Di. 150 lb crbys wks	lb.	...	1.00
Chlorosulfonic 1500 lb drs wks	lb	.15	.16
Chromic 98% 400 lb drs	lb	.37	.40
Chromotropic, 300 lb bbls	lb	1.00	1.06
Citric, USP, cryst 230 lb bbls	lb	.44½	.45
Powd, USP, 200 lb bbls	lb	.44½	.45
Imported crbys 112 lb kegs	lb	.43	.43½
Cleve's' 250 lb bbls	lb	.95	.97
Cresylic, 95% dark drs NY	gal	.57	.60
97-99% pale NY	gal	.60	.65
Formic, 85% tech., 140 cbys	lb	.10½	.11
Gamma, 225 lb bbls wks	lb	1.00	1.06
H 225 lb bbls wks	lb.	.57	.63
Hydrobromic, 48% com'l 155 lb cbys wks	lb	.45	.48
Hydrochloric (see Acid Muriatic)			
Hydrocyanic wks cyl	lb	.80	.90
HYDROFLUORIC, 30% 400 lb bbls wks	lb	...	.06
30% 100 lb cbys wks	lb	...	.08
48% single 100 lb cbys wks	lb	...	.10
52% 100 lb cby., wks	lb	...	.12
52% 100 lb cbys wks	lb	...	.11
60% 100 lb cby wks	lb	...	.14
60% 300 lb dr wks	lb	...	.13
White Acid 100 lb cby wks	lb	.25	.26
Hydrofluosilicic, 35% 450 lb bbls wks	lb	...	.11
J kegs wks	lb	...	3.00
LACTIC, 22% dark 500 lb bbls	lb	.05½	.06
22% light bbls	lb	.06½	.07
44% dark bbls	lb	.11	.12
44% light bbls	lb	.13	.13½
Laurent's 250 lb bbls	lb	.52	.54
Tank Cars	gal	...	.33½

Acetone—With a good demand noted for export the market is firm and prices are unchanged from the prevailing levels.

Acid Acetic—Continues in good demand in all quarters and makers are having no trouble in maintaining the scheduled prices.

Acid Citric—Has advanced ½c lb. during the past month and sellers are now holding firm at 44½c @45c lb. for domestic. The imported is also quite firm and consuming inquiry on both is good.

Acid Muriatic — Prices have shown no change since last reported with makers holding to the quoted prices and a steady volume of business noted.

Acid Oxalic—Still very firm for both domestic and imported, particularly the former. Sellers now ask 11¼c lb. for domestic in barrels and 12c lb. in kegs. Demand is good and stocks are scarce in all quarters.

Alcohol Butyl — Following the reductions of last week to 18¼c lb. in tankcars and proportionate reductions on other grades there has been no change in price. The market is only fairly steady.

Alcohol Denatured — There has been no change in price this week. At the recently established level of 40c gal. for completely denatured No. 5 the market is firm and consumers are showing a lively interest in the market. With the menace of the flood in the New Orleans district, where 35% of the country's output is centered, it is reported that most of these plants have ceased operation temporarily at least, and that some of them will be forced to close because of the inundation. This situation adds to the firm tendency of the market.

ACID, HYDROFLUORIC (Cont'd)			
ACID, Metanilic, 250 lb bbls	lb	.60	.65
Mixed, Sulfuric-nitric			
Drums, wks	N Unit	.07¾	.08
Drums, wks	S Unit	.01	.01½
Tank cars, wks	N Unit	.06	.0½
Tank cars, wks	S Unit	.008	.01
Monosulfuric F Delta 50 lb tins	lb	...	.65
MURIATIC, 20° cbys wks 100 lb		1.70	1.80
cbys c-l wks	100 lb	...	1.45
Tank cars wks	100 lb	...	1.05
18° 120 lb cbys c-l wks	100 lb	...	1.35
Tank cars, wks	net ton	...	.95
Naphthionic tech, 250 lb bbls	lb	.55	.59
N. & W. 250 lb bbls	lb	.95	.99
NITRIC 36° 135 lb			
Cbys c-l wks	100 lb	...	5.00
40° cbys c-l wks	100 lb	...	6.00
42° cbys c-l wks	100 lb	...	6.50
Le-l 25c 100 lbs, differential			
CP, cbys single wks	100 lb	.12	.13
Oxalic, 300 lb bbls wks N. Y.	lb	.11	.11¼
Imp., 560 lb casks	lb.	.11⅝	.12
Phosphoric, 50% 150 lb cbys	lb	.07	.07½
Syrupy USP, 70 lb drums	lb	...	.17
Demis	lb	...	.18
Imported	lb	.16	.16½
Phthalic, See Phthalic Anhydride			
Picramic, 300 lb bbls	lb	...	.50
Picric, 450 lb bbls c-l	lb	.30	.33
Pyrogallic tech 200 lb bbls	lb	...	.86
S kegs	lb	...	2.50
Salicylic tech., 125 lb bbls	lb	.27	.32
Sulfanilic, 250 lb bbls	lb	.15	.16
SULFURIC, 66° 180 lb cbys			
lc-l wks	100 lb	1.60	1.95
Cbys c-l wks	100 lb	...	1.35
1,500 lb drums wks	100 lb	...	1.20
Drums c-l wks	100 lb	...	1.00
Tank cars, wks	net ton	...	15.00
60° 1,500 lb drums wks	100 lb	...	1.10
Drums c-l wks	100 lb	...	.87½
Tank cars, wks	net ton	...	10.50
C.P. 175 lb cbys	100 lb	.07	.08
Oleum 20 pc 1500 lb drums			
lc-l wks	100 lb	...	1.50
Drums c-l wks	100 lb	...	1.25
Tank cars, wks	net ton	18.00	19.00
Oleum 40% drs lc-l wks	net ton	...	42.00
Oleum 60% drs wks	net ton	62.00	72.00
Tannic, tech., 300 lb bbls	lb	.30	.40
Tartaric, USP, cryst powd 300 lb bbls.	lb	...	.33
Imp., USP., 240 lb bbls	lb	...	.33
Tobias, 250 lb bbls	lb	...	.85
Tungstic, 100 lb kegs	lb	...	1.00
ALCOHOL, amyl See Fusel Oil			
Butyl Normal 50gal drs wks c-l	lb	.19	.20
Drums lc-l wks	lb	.19½	.20½
Tanks cars wks	lb	.18½	.19½
Butyl Tertiary 50gal drums	gal.	.50	.54
Diacetone, 50gal drs del.	gal	1.70	1.90
Ethyl, USP 190pf 50gal bbls	gal	...	3.70
Anhydrous, drums	gal	.50	.55
Denatured			

Alcohol, Ethyl, Denatured
Antimony, Needle

Chemicals

Antimony Chloride
Calcium Nitrate

ALCOHOL, Ethyl, Denatured	...	:	...
No. 1 Complete denat 190 pf			
50 gal bbl incl ...gal	...	:	.51½
Carlots .....gal	...	:	.49½
50 gal drums extra ...gal	...	:	.44½
Tank cars .....gal	...	:	.42½
No. 5 Complete denat. 188pf			
50 gal bbl incl. ....gal	...	:	.49
Carlots . .....gal	...	:	.47
50 gal drums extra ...gal	...	:	.42
Tank cars .....gal	...	:	.40
Isopropyl, refined, 90-91% 50 gal drs .....gal	1.00	:	1.25
Propyl nml., 50gal drs.....lb	...	:	1.00
Ref'd 98-99% drs .....gal	1.25	:	1.50
Aldehyde Ammonia, 100gal drums lb	.80	:	.82
Alpha-Naphthol crude 300 lb bbls lb	...	:	.65
Refined . .....lb	.85	:	.90
Alpha-Naphthylamine, 350 lb bbls lb	.35	:	.37
ALUM, Ammonia, lump 400 lb bbls wks le-l .....100 lb	3.15	:	3.50
Ground 400 lb bbls wks 100 lb	3.25	:	3.65
Powd, 380 lb bbls wks 100 lb	3.65	:	3.90
Chrome, 500 lb cks, wks lb	5.25	:	5.50
Potash, lump, 400 lb wks 100 lb	3.50	:	3.75
Bbls c-l wks.....100 lb	3.35	:	3.40
Imported lump .....100 lb	...	:	3.25
Ground, 400 lb bbls wks 100 lb	3.50	:	3.85
Imp., 350 casks .....100 lb	2.65	:	3.00
Powd., 380 lb bbls wks 100 lb	3.50	:	4.00
Chrome, 500 lb casks wks 100 lb	5.25	:	5.50
Soda Grd., 400 lb bbls wks 100 lb	...	:	3.75
Bbls., c-l wks ....100 lb	...	:	3.50
Aluminum metal, c-l NY....100 lb	...	:	26.00
Chloride, anhyd 275 lb drs....lb	.35	:	.40
Crystals, 375 lb bbls....lb.	...	:	.06¼
30% sol., 120 lb cbys..lb	...	:	.08
Hydrate 96% light 90 lb bbls lb	.17	:	.18
Hvy., 62-64% 220 bgs lb	.06	:	.06¼
400 lb bbls wks.....lb	.06¼	:	.07
Stearate, 100 lb bbls.....lb	.23	:	.24
SULFATE, Iron-free bags c-l wks . .....100 lb	...	:	1.75
Bbls c-l wks.....100 lb	...	:	1.90
Imported, spot ....100 lb	1.60	:	1.65
Com'l bags c-l wks 100 lb	1.35	:	1.40
Bbls c-l wks .....100 lb	...	:	1.55
Amidol (See Diaminophenol)			
Aminoazobenzene, 110 lb kegs...lb	...	:	1.15
AMMONIA, anhyd. 100 lb cyl...lb	.11	:	.12¼
Water, 26° 800 lb drs del....lb	...	:	.03
Drs., c-l delivered.....lb	...	:	.02¾
Tanks . .....lb	.02¼	:	.02½
CP cbys .....lb	...	:	.12
Acetate, 100 lb kegs.....lb	...	:	.34
Bifluoride, 300 lb bbls.....lb	.21	:	.22
100 lb kegs .....lb	.22	:	.23
Bromide, 450 lb bbls 50 lb bxs lb	...	:	.55
Imported, 112 lb boxes....lb	.50	:	.52
Carb. tech., 500 lb cases....lb	.03¾	:	.09
Powd., tech., 550 lb cks lb.	.07¼	:	.07¾
USP, lump 100 lb kegs ...lb	.11	:	.11½
Powd. 100 lb kegs ...lb	.13	:	.13½
Chloride White 250 lb bbls wks lb	.05¼	:	.05½
250 lb bbls c-l wks .....lb	...	:	
Imp. white 600 lb cks lb	...	:	.05½
C.P. USP, gran bbls ..lb	.13	:	.13½
Gray, 250 lb bbls wks ....lb	.05¾	:	.06
Bbls., c-l wks .....lb	...	:	
Imp. gray 550 lb cks .lb	.06	:	.06¼
Lump, 500 lb casks spot ..lb	.11	:	.11¼
Lactate, 500 lb bbls .....lb	.15	:	.16
Refined Crystals bbls .....lb	...	:	.20
Oxalate, pure 100 lb kegs ...lb	.35	:	.37
Persulfate, 112 kegs .....lb	.27½	:	.30
Phosphate, dibasic 200 lb bbls lb	...	:	.38
Tech., powdered 325 lb bbls lb	...	:	.18
Mono, 325 lb bbls ... lb	.12	:	.12½
Sulfate, bulk c-l .....100 lb	...	:	2.40
Southern points ...100 lb	...	:	2.40
Imp., 300 dbl bgs fas 100 lb	...	:	2.50
Sulfocyanide tech., 100 lb kgs lb	.40	:	.45
Amyl-Acetate, tech., 50gal drs gal	...	:	2.25
Refined 50gal drums ....gal	2.40	:	2.50
Alcohol, see Fusel Oil			
ANILINE OIL, 960 lb drums ...lb	.15	:	.16
Salt 200 lb bbls .....lb	...	:	.24
Anthracene, 80-85% 600 lb casks wks .....lb	.60	:	.65
Anthraquinone, sub 125 lb bbls lb	.90	:	1.00
Antimony metal slabs tons lots lb	.12¾	:	.13
Needle powd 100 lb cs lb	.15½	:	.16

Ammonium Anhydrous — There has been no change in the situation on this market. Stocks are in good supply but there has been no downward movement in price. Sellers anticipate an increased demand at an early date.

Ammonium Chloride—Since the reduction in price of the domestic white to 5¼c lb. there has been no change in the situation. Makers found this step necessary to meet foreign competition. At this level sales are of good volume. The 5¼c lb. price is New York, with the usual freight charge to other points. Domestic gray is lower at 5.70c lb. also to meet competition, with the market quiet.

Ammonium Sulfate—With stocks in good supply first hands have again lowered the price in all sections to $2.40 100 lbs. The market is not particularly weak as sales are in good volume, but factors prefer to clear stocks wherever possible.

Aniline Oil — With consuming demand of a routine nature the market is generally quiet with prices steady.

Arsenic—The market seems to have a better tone with the approach of the best consuming season and prices are firm at 3¾c lb. in kegs in this territory.

Barium Chloride—There is still a tendency noted on the part of makers here to shade prices to meet imported competition, with open quotations still at $60.00 ton. Importers are quoting $55.00@$60.00 ton as to position and quantity.

Benzene — With some factors continuing to quote 24c as the open market price, the market is weak and dull. Good sized movements of 90% material in tank cars is noted in some directions at 22c@ 23c gal. The large production of benzene is accountable for this situation.

Beta-naphthol—There has been no change in the position with a good demand noted and prices steady.

Bleaching Powder—The market is steady at prevailing levels with average sales reported.

ANTIMONY CHLORIDE, anhyd 1000 lb drs .....lb	.16	:	.17
50 lb crocks .....lb	.45	:	.48
Sol'n 130 lb carboys 48° lb	...	:	.17
Oxide, 500 lb bbls .....lb	.16¼	:	.17
Sulfuric golden, 250 lb bbls lb	.15	:	.16
Crimson 250 lb bbls ....lb	.25	:	.27
Vermilion, 250 lb bbls ....lb	...	:	.37½
Tartrolactate, 500 lb bbls ....lb	...	:	.45
Arsenic metal 220 lb kegs .....lb	.45	:	.50
Red, 224 kegs cases ....lb	.10½	:	.11
White, 112 lb cases NY.....lb.	...	:	.03¾
BARIUM DIOXIDE, see Barium dioxide			
Carbonate 300 lb bbls wks ..ton	50.00	:	52.00
200 lb bgs wks .....ton	47.50	:	50.00
Imports, casks NY .....ton	47.00	:	48.00
Chlorate, 112 lb kegs NY ....lb	.12	:	.12¼
Chloride, 800 lb bbl wks ...ton	61.00	:	63.00
200 lb bgs wks.....ton	60.00	:	62.00
Imports spot .....ton	60.00	:	62.00
Dioxide, 88% 690 lb drs ....lb	.13	:	.13½
Import, 86-88% 400 lb drs lb	.13	:	.13½
Hydrate, 500 lb bbls .....lb	.04¾	:	.04¾
Nitrate, 700 lb csks.....lb	.07½	:	.08
Sulfocyanide 600 lb bbls .....lb	.27	:	.28
Barytes, floated 350 lb bbls wks ton	23.00	:	24.00
Imported .....ton	29.00	:	33.00
Benzaldehyde tech. 945 lb drs wks lb	.65	:	.70
BENZENE			
Comm, 90% 8,000gal tks wks gal	.22	:	.24
Commercially pure tks wks...gal	.22	:	.24
Drum lots 5c gal higher			
Benzidine Base, dry 250 lb bbls lb	.70	:	.74
Benzol, see Benzene			
Benzoyl Chloride 500 lb drs ....lb	...	:	1.00
Benzyl Acetate 100 lb cbys ....lb	1.30	:	1.40
Benzoate, bulk .....lb	1.15	:	1.35
Chloride 95% tech 925 lb drs lb	...	:	.25
100 lb cbys .....lb	.25	:	.30
BETA-NAPHTHOL 250 lb bbls wks lb	...	:	.24
c-l .....lb	...	:	.22
Sublimed .....lb	.55	:	.60
Beta-Naphthylamine tech 200 lb bbls .....lb	.63	:	.67
Sublimed, 200 lb bbls .....lb	...	:	1.35
Blanc Fixe, dry 400 lb bbls wks ton	80.00	:	90.00
Imported, bbls .....ton	70.00	:	72.00
Paste, 650 lb bbls c-l ..ton	45.00	:	55.00
BLEACHING POWDER, 700 lb drs c-l wks contract ....100 lb	...	:	2.00
c-l spot wks . ....100 lb	...	:	2.10
300 lb drs c-l wks contract 100 lb	...	:	2.25
c-l spot wks .....100 lb	...	:	2.35
le-l 15c 100lbs differential			
Blues, bronze Chinese, Milori Prussian Soluble .....lb	.30	:	.33
Blue Vitriol, see Copper Sulfate			
Bone Ash, 100 lb kegs .....lb	.06	:	.07
Black, 200 lb bbls .....lb	...	:	.03¼
Borax, crys., 500 lb bbls .....lb.	.04½	:	.05
Powdered, 300 lb bbls .....lb	.04¼	:	.04½
Kgs 100-150 lb .....lb	.04¾	:	.05¼
Bordeaux Mixture, 16% pd ....lb	.11	:	.12
Paste, bbls .....lb	.08	:	.10
Bromide, see potass. bromide etc			
Butter of Antimony, see Antimony Chloride			
Butyl Acetate normal tk drs wks gal	1.42	:	1.45
Drums c-l wks .....gal	1.44	:	1.47
Drums, le-l wks ..gal.	1.47	:	1.50
Secondary 50gal drums ...gal	1.00	:	1.05
Aldehyde 50gal drs wks ....lb	.70	:	.75
Propionate, drs ....lb	.34	:	.36
Stearate 50gal drs .....lb	...	:	.60
Tartrate drs .....lb	.57	:	.60
CADMIUM, metal 100 lb bxs ..lb	.70	:	.75
CALCIUM Acetate 150 lb bgs c-l 100 lb	...	:	2.50
Arsenate, 100 lb bbls c-l wks lb	.07½	:	.08
Bromide, 100 lb cs .....lb	...	:	.60
Carbide, 220 lb dr c-l wks ..lb	.05½	:	.06¼
Carbonate, tech 100 lb bags c-l .....100 lb	1.00	:	1.10
USP, precip, 175 lb bbls ..lb	...	:	.06½
Chloride, solid 650 lb drs c-l f.o.b. wks .....ton	21.00	:	22.00
Drums delvd. NY ..100 lb	1.74	:	1.89
Imp., Shipment .....ton	...	:	19.50
Flake, 375 lb drs c-l drs f.o.b. wks .....ton	...	:	27.00
Drums delvd. NY ..100 lb	2.04	:	2.19
Bags delvd NY ..100 lb	2.04	:	2.19
Nitrate, 220 lb bbls c-l NY ..ton	...	:	52.00

Calcium Phosphate
Dibutyl Phthalate

Chemicals

Dibutyl Tartrate
Glycerin

CALCIUM, Phos., tech450 lb bbls lb	.09	:	.10
Phosphate mono, 325 lb bbls . lb	.07	:	.08
Stearate, bbls ..... lb	.23	:	.25
Sulfocarbolate, 100 lb kegs .. lb	.53	:	.57
CAMPHOR, Amer. ref250 lb bbls lb	...	:	.72
2½ lb slabs, 100 lb cs.... lb	...	:	.73½
Jap., ref slabs 100 lb cs..... lb	.69	:	.70
Powdered ..... lb	...	:	.80
Crude, 100 lb cs ..... lb	.54	:	.56
Carbon Bisulfide 500 lb dr lc-l NY lb	.05½	:	.06
c-l drums NY ..... lb	...	:	.05¼
Carbon Black, c-l wks bags .... lb	.08	:	.09
100-300 lb cases lc-l NY . lb	...	:	.12
Decolorizing 40 lb bags c-l ... lb	.08	:	.15
90 lb drums c-l ..... lb	.08¾	:	.15¾
Carbon Dioxide, Liquid 20-25 cy lb	...	:	.06
Tetrachloride, 1400 lb drs del lb	.07	:	.07½
Drums c-l delivered ..... lb	...	:	.06¾
Casein, edib., 100 lb kegs ..... lb	.45	:	.65
Standard ground ..... lb	.18	:	.18½
Caustic Potash see potash, caustic			
Caustic Soda, see soda, caustic			
Cellulose Acetate, 50 lb kegs .... lb	...	:	1.40
Cerium Oxalate USP, 100 lb kegs lb	.33	:	.35
Chalk, drop 175 lb bbls ..... lb	.03	:	.03¾
Precip., light 250 lb bbls csks lb	...	:	.04½
Precip., heavy 560 lb casks .. lb	.02¼	:	.03½
Bulk ..... ton	...	:	5.00
Precip, English 7 lb bags ..... lb	...	:	.08½
Precip., heavy 560 lb casks ... lb	.03½	:	.03¾
Chinese Blue, See Blue			
Chloramine USP, 200 lb bbls .. lb	...	:	1.75
Chlorocosane 5 lb bot ..... lb	.55	:	.65
Chlorhydrin, Ethylene See Ethylene			
CHLORINE, Liquid tank or multi-unit car wks contract . lb	...	:	.04
Tank car spot wks .... lb	...	:	.04¾
Carlots cyl wks contract lb	...	:	.05½
spot wks ..... lb	...	:	.05¾
lc-l cyl wks contract .. lb	.08	:	.09
Spot wks ..... lb	.08¼	:	.09¼
Chlorobenzene, mono, 100 lb drs wks lc-l ..... lb	...	:	.07
CHLOROFORM, USP, 50 lb drs .. lb	...	:	.30
Second hands 650 lb drs .. lb	.27½	:	.28½
Technical 1,000 lb drums .. lb	.20	:	.22
Chlorophyll Oil Sol. ..... lb	3.75	:	4.00
Water Sol ..... lb	.75	:	4.00
Chromium Acetate 20° sol'n 400 lb bbls ..... lb	...	:	.05½
Fluoride, Powd., 400 lb bbls .. lb	.27	:	.28
Oxide, Green bbls ..... lb	.34½	:	.35½
Chrome Green, CP ..... lb	.26	:	.29
Comm. ..... lb	.06½	:	.11
Chrome Yellow ..... lb	.17	:	.18½
Clay c-l Bulk, Del., ... ton	16.00	:	18.00
Powdered 125 lb bags .... ton	...	:	20.00
Coal Tar, See Tars			
Cobalt metal 100 lb kegs .... lb	2.50	:	3.00
Cobalt Oxide 500 lb bbls ..... lb	2.00	:	2.10
10 lb tins 200 lb cases ..... lb	...	:	2.20
COPPER, metal electrolytic ..100 lb	12.90	:	13.00
Lake c-l NY.....100 lb	13.00	:	13.12½
Carbonate 400 lb bbls ..... lb	.16¾	:	.17¼
Chloride 250 lb bbls ..... lb	...	:	.28
Cyanide 100 lb drs ..... lb	.48	:	.50
Oxide, red 100 lb bbls tons .. lb	.16½	:	.17
Sub-acetate verd 440 lb bbls .. lb	.18	:	.19
SULFATE crys 450 lb bbls 100 lb	5.05	:	5.25
Carlots, bbls wks 100 lb	...	:	4.95
Powd. 350 lb 5bbls ....100 lb	...	:	5.25
Copperas bulk, crystal and sugar c-l wks ..... ton	...	:	13.00
200 lb bgs c-l wks .... ton	...	:	15.00
400 lb bbls c-l wks .... ton	...	:	18.00
Powdered bbls .....100 lb	1.90	:	2.00
Sugar, 100 lb bbls .....100 lb	1.25	:	1.35
Cotton Soluble 100 lb bbls wet .. lb	.40	:	.42
CREAM TARTAR, USP, 300 lb bbls . ..... lb	.24½	:	.24¾
Imp., powd., USP, 224 bbls.. lb	.23¾	:	.24
Creosote USP 42 lb cbys ..... lb	.40	:	.42
Creosote Oil Natural 50gal drs ..gal	.20	:	.21
10-15% Tar acid .....gal	.25	:	.26
25-30% Tar acid .....gal	.28	:	.29
Cresol, USP, 400 lb drums .... lb	.20	:	nom.
Cyclohexanol, see Hexalene			
Cymene, See Para-Cymene			
DIAMINOPHENOL, 100 lb kegs lb	...	:	3.80
Diamyl Phthalate drums, wks ..gal	2.95	:	2.97
Dianisidine, 100 lb kegs ..... lb	3.25	:	3.35
Dibutyl Phthalate wks .....gal	2.75	:	2.80

Bordeaux Mixture — Sales have been in good volume during the early buying season with prices well maintained in all directions.

Calcium Arsenate—The season for calcium arsenate has not opened yet and the market is still very dull with the openly quoted price of 7½c lb. prevailing in this territory.

Carbon Tetrachloride — No changes noted since last reported, with sales up to the average and prices holding well.

Casein — Imported standard ground is fractionally lower on spot at 18c@18¼c lb. this week, though the market is by no means weak. Shipment prices are about on a par with spot quotations. Domestic is named at 18½c@19c lb. Consuming sales are routine at the moment.

Copper Sulfate—Is outstanding in the heavy chemical group from the angle of interest. Carlots are now very firm at $4.95 100 lbs. with less carlots higher at from $5.05@$5.25 100 lbs. according to quantity and seller. Buyers are freely in the market at these levels.

Copperas—A firm market continues to prevail in all quarters with prices unchanged.

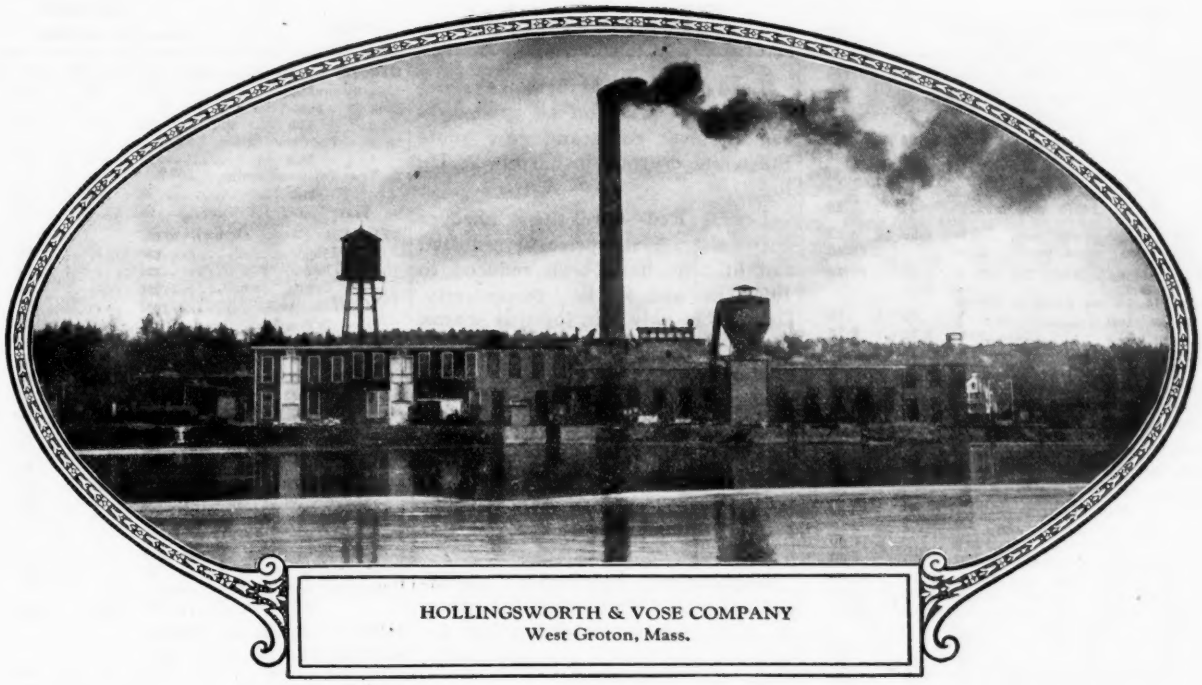
Cream of Tartar—Some makers have again advanced the price and now ask 24½c lb. in barrels. Imported is firm also at unchanged prices. Consuming interest is good.

Diphenlyamine—At the level of 45c@47c lb. the market is steady on an average sale.

Glycerin—Demand is routine at the moment and there are reports current of a shading below 24c lb. on a sale of dyamite. It is believed that speculators have come into possession of a good portion of foreign goods. Crude saponification is unchanged at 18¼c@19-c lb. and lye is likewise the same at 16¼c lb. There is still a tendency noted to shade on C. P. business, though the market is openly held at 26c lb.

Glauber's Salt — With stocks still in good supply and the demand not exceptional the market remains fairly easy.

Dibutyl Tartrate, 50gal drums .. lb	.55	:	.65
Dichlorobenzene, 1,000 lb drums.. lb	.06	:	.07
Dichloromethane drums, wks .... lb	.23	:	.25
Diethylamine, 400 lb drs ..... lb	...	:	2.15
Diethylaniline, 850 lb drs ..... lb	.55	:	.60
Diethyl Carbonate, drums .....gal	1.85	:	2.00
Diethyl Phthalate 1,000 drums . lb	.25	:	.28
Diethyl Sulfate tech., 50gal drs lb	.20	:	.25
Dimethylamine, 400 lb drs ..... lb	...	:	2.60
Dimethylaniline 340 lb drs wks lb	.32	:	.34
Dimethylsulfate, 100 lb drs .... lb	.45	:	.50
Dinitrobenzene, 400 lb bbls .... lb	.15½	:	.16½
Dinitrochlorobenzene, 400 lb bbls lb	.15	:	.16
Dinitrochlorine, 300 lb bbls .... lb	.18	:	.19
Dinitronaphthalene, 350 lb bbls . lb	.32	:	.34
Dinitrophenol, 350 lb bbls ..... lb	.31	:	.32
Dinitrotoluene, 300 lb bbls .... lb	.18	:	.19
Diorthotolylguanidine, 275 lb bbls wks ..... lb	.85	:	.90
Diphenylamine . ..... lb	.45	:	.47
Diphenylguanidine 100 lb bbls .. lb	.68	:	.72
EPSOM SALT, tech., 300 lb bbls NY .....100 lb	...	:	2.00
Bbls c-l NY .....100 lb	...	:	1.75
100 lb c-l NY 100 lb	1.50	:	1.75
Imp., 20 lb bags c-l ..	1.05	:	1.10
USP, 200 lb bbls 10bbls Seaboard .....100 lb	...	:	2.35
Interior .....100 lb	...	:	2.50
Carlots, bbls kegs Seaboard .....100 lb	1.90	:	2.15
Interior .....100 lb	2.00	:	2.25
Imported, 400 lb bbls .100 lb	1.70	:	2.00
ETHER, USP, 55 lb drums .... lb	...	:	.14
Ethyl Acetate, 99% 50gal drs gal	...	:	1.05
85% Ester, 10gal drs ..gal	...	:	.77
Carlots drums .....gal	...	:	.74
Tank cars .....gal	...	:	.72
Refined drums .....gal	1.72	:	1.85
Aceto Acetate drums wks .... lb	...	:	1.00
Benzyl Aniline, 300 lb drs .. lb	1.05	:	1.11
Bromide, 115 lb drs ..... lb	...	:	.50
Chloride, 200 lb drs ..... lb	...	:	.22
Lactate drums wks .....gal	...	:	2.50
Methyl Ketone, 50gal drs ... lb	.30	:	nom.
Oxalate drums wks ..... lb	.45	:	.55
Ethylene-Bromide 600 lb drs ... lb	...	:	.70
Chlorhydrin, anhyd., 50gal drs lb	.75	:	.85
40% Solution, 50gal bbls lb	.25	:	.30
Dichloride, 50 gal drs. ..... lb	...	:	.11
Tank cars ..... lb	...	:	.06
Glycol 50gal drums wks .... lb	.30	:	.40
Tri Chloride ..... lb	.10	:	.10½
Ethylidenaniline ..... lb	.62	:	.65
Feldspar bulk .....ton	20.00	:	25.00
FERRIC CHLORIDE tech., crys. 475 lb bbls ..... lb	.07½	:	.09
Imported ..... lb	.04¼	:	.05
C.P., crys., 100 lb kegs .. lb	...	:	.10
Imported ..... lb	.08	:	.06½
Neut. Soln. 42° 140 lb cbys lb	.06½	:	.07
46° 140 lb cbys ..... lb	.08	:	.08½
USP, Soln 125 lb cbys .... lb	.06½	:	.07
Bromide solution ..... lb	...	:	.55
Ferrous Bromide sol'n ..... lb	...	:	.55
Chloride cryst tech 475 lb bbls lb	.05	:	.06
Sulfide 1000 lb bbls ....100 lb	2.50	:	3.00
Flake-White see lead White			
Fluorspar, 95% 220 lb bags ex-dock .....ton	...	:	25.00
96% bags .....ton	...	:	33.50
98% bags .....ton	...	:	35.00
FORMALDEHYDE USP, 400 lb bbls c-l wks ..... lb	...	:	.11¼
Bbls 400 lb lc-l wks ..... lb	.11½	:	.11¾
Formaldehyde Aniline 100 lb drs lb	.39	:	.42
Furfural 500 lb drums ..... lb	...	:	.17½
Tanks, wks ..... lb	...	:	.15
Fusel Oil 10% Impurities drs gal	...	:	1.60
G SALT paste 360 lb bbls basis 100% ..... lb	.50	:	.52
GLAUBER'S SALT, tech., 200 lb bags c-l wks .....100 lb	1.05	:	1.10
lc-l wks .....100 lb	1.15	:	1.20
350 lb bbls c-l wks .100 lb	...	:	1.10
Bbls lc-l wks .....100 lb	1.25	:	1.35
Imported bags NY ..... lb	.75	:	.80
Calcined, see Sodium Sulfate			
GLYCERIN, CP. 550 lb drums lb	.25½	:	.26
Dynamite, 100dr ..... lb	...	:	.24
Saponification tanks ..... lb	.18¼	:	.18½
Soap, Lye tanks ..... lb	.16¼	:	.16½



HOLLINGSWORTH & VOSE COMPANY
West Groton, Mass.

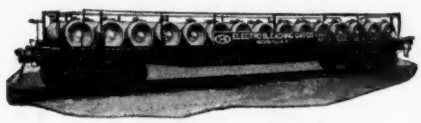
Another Hollingsworth & Vose mill enjoys the advantages of E B G Liquid Chlorine

THE West Groton Mill of the Hollingsworth & Vose Company observed that time and labor wastes were abolished, and bleaching production improved, when Liquid Chlorine was installed in the East Walpole Mill of this company, so it was natural that they should utilize in all their mills Liquid Chlorine, the chemical that has revolutionized paper bleaching.

The adoption of Liquid Chlorine by this mill was another accession to the idea that the bleaching process is simplified and improved by Liquid Chlorine.

Single-unit tank cars holding approximately 30,000 pounds, and multi-unit tank cars consisting of 15 one-ton containers, offer the large user of E B G Liquid Chlorine every possible advantage.

SINGLE-UNIT TANK CAR



MULTI-UNIT TANK CAR

E B G SERVICE

Includes abundant production facilities and container equipment, of course; expert engineering counsel in the use of Liquid Chlorine which would naturally be expected of the pioneer manufacturer. But beyond these a service which is much more comprehensive than the usual conception. Investigation will reveal the significance of this.

EBG

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

Plant: NIAGARA FALLS, N.Y.

Main office 9 East 41st Street New York

Hexalene
Manganese Sulfate

Chemicals

Mercury
Para-Phenetidin

Hexalene, 50gal drs., wks	lb	...	.60
Hexamethylenetetramine drs	lb	.80	.82½
HYDROGEN PEROXIDE, 10 vol			
400 lb bbls	lb	.04⅛	.05
15vol	lb	.06	.06¼
17vol	lb	.06¼	.06½
25vol	lb	.06½	.06¾
100vol 140lb cbys	lb	.24	.26
IODINE, crude 200 lb kegs	lb	4.20	4.25
Iridium, metal, 10oz lots	oz	...	260.00
Iron, metal by hydrogen 1 lb bot	lb	.68	.70
IRON Chloride see Ferric or Ferrous			
Nitrate, kegs	lb	.09	.10
Com'l bbls	100 lb	2.50	3.25
Oxide, red Spanish	lb	.02½	.03¼
English	lb	.10	.12
Perchloride ,see Ferric Chloride			
Isopropyl Acetate 50gal drums	gal	.85	.90
Kaolin see Clay			
LANOLIN, see Adeps Lanae			
LEAD, metal c-l NY	100 lb	...	6.65
Acetate, white crystals 500 lb bbls wks	100 lb	13.00	13.50
100 to 200 lb kegs wks	100 lb	...	14.00
White, broken bbls wks	100 lb	13.50	14.00
White, gran bbls wks	100 lb	13.50	15.00
White, powd bbls wks	100 lb	13.75	14.25
Brown, broken bbls wks	100 lb	12.00	13.00
Arsenate, 100 lb kegs	lb		
Bbls., c-l wks	lb	...	.14
Bbls, lc-l wks	lb	.14½	.15
Paste, 100 & 600 lb bbls	lb	.08	.09
Nitrate, 500 lb bbls wks	lb	...	.14
Oxide, Litharge 500 lb bbls	lb	...	.09¼
100 kegs wks	lb	.14¼	.15¼
Oxide, red, 500 lb wks	lb	...	.10
100 lb kegs wks	lb	.12¾	.16¼
Oleate, bbls	lb	.17½	.18
Peroxide, 100 lb drs	lb	.25	.30
White, basic carb., 500 lb bbls wks	lb	...	.08¾
100 lb kegs wks	lb	.14¼	.15¾
White sulfate 500 lb bbls wks	lb	.09	.09½
LIME, (Salts, see Calcium Salts)			
Ground Stone, bags	ton	...	4.50
Live, bulk	ton	...	8.50
Live, 325 lb bbls tons wks 100 lb		...	1.05
Hydrated, 167 lb bbl ton lots wks	100 lb	...	.85
Single bbl wks	lb	...	.01
Oyster Shell 150 lb bbl sing	lb	...	.03½
Sulfur dry 200 lb drs NY	lb	...	.03½
Drs. c-l NY	lb	...	.07½
33° Sol'n 50 lb bbls NY	gal	.15	.15½
Litharge see lead oxide			
Lithium Carb., USP 100 lb kegs	lb	1.45	1.60
Bromide 100 lb cs	lb	1.80	1.90
Lithopone, 400 lb bbls lc-l wks	lb	...	.06½
Bbls., c-l wks	lb	...	.05½
Bags c-l wks	lb	...	.05½
Imported, 400 lb bbls	lb	.05¾	.06
MAGNESITE, calcined, 500bbls	ton	48.00	50.00
Magnesium mtl., sticks 100 lb cs Wks.	lb	...	.80
Carb., tech., 70 lb bags NY	lb	.06	.06½
75 lb bbls NY	lb	.08	.08½
USP, 100 lb bbls	lb	.09½	.10
English cs blocks	lb	.17	.19
MAGNESIUM, Chloride, flake 575 lb drs. c-l wks	ton	...	37.00
Imp., Flake Shipt.	ton	...	33.00
Imp., fused 900 lb bbls NY	ton	...	31.00
Fluosilicate cryst 400 lb bbls wks	lb.	.10	.10½
30% sol'n 500 lb bbls wks	lb	.07	.07½
Sol'n bbls., c-l wks	lb	...	.06
Oxide, USP, light 100 lb bbls	lb	...	.42
USP, heavy 250 lb bbls	lb	...	.50
Salicylate, 100 lb kegs	lb	.75	.80
Stearate bbls	lb	.23	.25
Sulfate, see Epsom Salts			
Manganese Borate, 30% 200 lb bbls	lb	...	.24
100 lb kegs	lb	...	.25
Chloride, 600 lb cks	lb	.08	.08½
Dioxide, 80-84% 900 lb bbls NY	ton	80.00	85.00
85-90% 900 lb bbls NY	ton	85.00	90.00
Hydrated, precip 100 lb kegs	lb	.15	.23
Ore, bulk cif NY	lb	.35	.40
Sulfate, 550 lb drums NY	lb	.07	.07¼

Lead Acetate—Makers have reduced their price on all grades 1c lb. on lower costs and now quote the white crystals in barrels at 13c lb.

Lead, Red—On the cheaper costs of lead, the price of red lead and litharge have been reduced to 10¼c lb. and 9c lb. respectively. Demand is only fair for this season of the year.

Mercury—While the advance in spot as well as shipment prices seems halted, the market shows no soft spots and importers continue to name $124.00 flask as the rock bottom price for spot offers. Consuming interest is not brisk at this level.

Naphthalene—Movement continues in good volume and the prices of 5c lb. for flakes and 6c lb. for balls at the works are well maintained in all directions.

Orange Mineral—Price is fairly steady at the quoted level on an average demand.

Para-Toluidine—Supplies continue in good volume and the consuming demand is limited.

Phenol—Since the reduction in price to 16c lb. the market has been fairly steady at this level.

Potash Caustic—The market is firm with sellers still asking 7½c lb. in carlots and 8c lb. for lesser quantities. Sales are about up to the average.

Potash Salts—New prices from shipment released last week are at the same level as those prevailing over the previous period. There is a genuine shortage of potash salts on spot, caused by the fact that the German company which was replaced here last week by another agent, did not order any stocks for some time prior to their cecession on business.

Sodium Nitrate—Importers persist in asking $2.60 100 lbs. for spot parcels and as a result the market is very dull. With the new season offers but a short time ahead buyers will not pay the difference of 50c 100 lbs. at the end or the season.

Vermillion — Importers have again advanced the price and are now asking $1.90@$1.95 lb. for spot stocks. It is freely admitted that consuming demand has fallen off since the sharp advances.

MERCURY, metal 75 lb flask flask		124.00	126.00
Meta-Nitro-aniline	lb	.72	.74
Meta-Nitro-para-Toluidine, 200 lb bbls	lb	...	1.70
Meta - Phenylenediamine, 300 lb bbls	lb	.90	.94
Meta - Toluylenediamine, 300 lb bbls	lb	.72	.74
Tanks	lb	...	.70
METHANOL (Wood Alcohol) drms. 95%	gal	...	.80
Drums, c-l	gal	...	.83
Drums, lc-l	gal	...	.85
97% tanks	gal	...	.82
Drums, c-l	gal	...	.85
Drums, lc-l	gal	...	.87
Pure, Acetone free, tanks	gal	...	.85
Drums, c-l	gal	...	.88
Drums, lc-l	gal	...	.90
U. S. denat., grd., tanks	gal	...	.80
Drums, c-l	gal	...	.83
Methyl Acetate drums	gal	...	.95
Methyl Acetone, 100gal drums	gal	.88	.90
Tank cars	gal	...	.85
Chloride, 90 lb cyl	gal	.55	.60
Monobromobenzene See Bromobenzene			
Monacetine, See Acetine			
Monochlorobenzene, see Chlorobenzene			
Monethylaniline, 900 lb drs	lb	...	1.05
Monomethyl paraminophenol sulfate 100 lb drs	lb	3.95	4.20
NAPHTHA, see Solvent Naphtha			
NAPHTHALENE, Fiske, 175 lb bbls wks	lb	.05	.05½
Balls, 250 lb wks	lb	.06	.06½
Crushed, chipped bgs wks	lb	...	.04⅜
Crude, imp., bags	lb	.02	.02¼
NICKEL, Ingot 100 lb kegs		...	.35
Chloride, bbls kegs	lb	.21	.24
Oxide, 100 lb kegs NY	lb	.35	.38
Salt single 400 lb bbls NY	lb	.08	.08½
Double 400 lb bbls NY	lb	.08½	.09
Sulfate, See Nickel Salt single			
Nickel Metal, electrolytic	100 lb	...	34.00
Nicotine, Free, 40% 8 lb tins cs	lb	1.25	1.30
Nicotine Sulfate 10 lb tins	lb	...	1.10
NITRATE SODA, spot, See Sodium Nitrate			
Nitre Cake, bulk wks	ton	4.50	5.50
500 lb bbls	ton	13.00	14.00
Nitrobenzene, Redistilled 1000 lb drs. wks	lb	.09¼	.10¼
Nitronaphthalene, 550 lb bbls	lb	...	.25
Nitrotoluene, mixed 1,000 lb drs wks	lb	.14	.15
Oil Fusel, See Fusel Oil			
Oil Methane, see nitrobenzene			
Orange-Mineral, 1100 lb sks NY	lb		14¼
700 lb bbls NY	lb	...	14¼
Ortho-Aminophenol, 50 lb kegs	lb	2.20	2.25
Ortho-Anisidine, 100 lb drs	lb	2.35	2.50
Ortho-Dichlorbenzene, see Dichlorbenzene			
Ortho-Nitrochlorobenzene, 1,200 lb drs. wks	lb	.32	.35
Ortho-Nitrophenol, 350 lb	lb	.85	.90
Ortho-Nitrotoluene, 1,000 lb drs wks	lb	.13	.14
Ortho-Toluidine l c l 350 lb bbls	lb	.25	.27
PALLADIUM, metal 10oz lots	oz.	80.00	81.00
Para-Aminoacetanilid, 100 lb kgs	lb	1.00	1.05
Para-Aminophanol, 100 lb kegs	lb	...	1.15
Hydrochloride, 100 lb kegs	lb	1.25	1.30
Para-Dichlorbenzene, 150 lb bbls wks	lb	.17	.20
25-50 lb kegs	lb	.20	.21
Paraldehyde .10-55gal drs USP tech	lb	.26	.28
Para-Cymene, def'd. 110gal drs.	gal	2.25	2.50
Paraformaldehyde USP 100 lb cs	lb	.53	.53½
Para-Nitroacetanilid, 300 lb bbls	lb	.50	.55
Para-Nitroacetanilid 300 lb bbls	lb	.50	.55
PARA-NITROANILINE, 300 lb bbls wks single bbls	lb	.53	.53
Para-Nitrochlorobenzene, 1,200 lb drs wks	lb	...	.32
Para-Nitro-ortho Toluidine, 300 lb bbls	lb	2.75	2.85
Para-Nitrophenol, 185 lb bbls	lb	.50	.55
Para-Nitrosodimethylaniline, 120 lb bbls	lb	.92	.94
Para-Nitrotoluene, 350 lb bbls	lb	.25	.30
Para-Phenetidin, 500 lb drs	lb	1.55	1.80

Pure Phthalic Anhydride

Phthalic Anhydride of the highest purity has been produced by us in commercial quantities for over 9 years and this pure Phthalic Anhydride is well-known to the trade as SELDEN BRAND. Its form is the natural long needle crystal which dissolves and melts much more rapidly than in any other form.

We pack this material in new slack barrels containing 150-lb. net weight of Phthalic Anhydride and these packages are so constructed that their use for re-shipment is a well established fact among our customers.

Our service on Phthalic Anhydride is unexcelled and we are in position to make prompt shipment in carload lots.

Your inquiries will have our prompt attention and we will be pleased to furnish quotations and samples at your request.

THE SELDEN COMPANY

Pittsburgh, Pa., U. S. A.

Para-Phenylenediamine
Sal Soda

Chemicals

Salt Common
Sodium Oxalate

Para-Phenylenediamine 350 lb bbls lb	...	:	1.20
Para - Toluene-Sulfonamide, 175 lb bbls	.40	:	.41
Para - Toluene-Sulfonchloride, 410 lb bbls wks	.18	:	.30
Para-Toluidine, 350 lb bbls wks. lb	.38	:	.42
PARIS GREEN,			
Arsenic Basis, 500 lb kegs lb	.19	:	.20
Kegs, 100 lbs lb	.21	:	.22
Paris White, see Whiting French			
PETROLATUM, green 300 lb bbls lb	.02½	:	.03
Dark Amber, 300 lb bbls lb	...	:	.04¼
Light Amber, 300 lb bbls lb	...	:	.04½
Phenol, see also acid carbolic, 950 lb drums wks lb	.16	:	.17
Small drums 250-100 lb lb.	.17	:	.18
Natural 240 lb dcs drs wks lb	...	:	...
Phenyl-Alpha-Naphthylamine 100 lb kegs lb	...	:	1.35
Phosphorus, red 110 lb cs lb	...	:	.65
Yellow 110 lb cs wks lb	...	:	.32
Imported, 110 lb cs wks lb.	.35	:	.37½
PhosphorousOxychloride 175 lb cyl lb	.35	:	.40
Phosphorous Sesquisulfide 100 lb cases lb	...	:	.46
Phthalic, Anhydride, 100 lb bbls wks lb	.18	:	.20
Pitch, Coal-Tar wks ton	24.00	:	26.00
Plaster Paris, tech 250 lb bbls bbl	...	:	3.30
Platinum metal soft, 10oz lots oz	95.00	:	97.00
Potash, Caustic, Imp., c-l, cks lb	...	:	.07½
Domestic, wks lb	...	:	.07⅛
POTASH SALTS, rough			
Pot. Muriate basis 80% bgs ton	...	:	36.40
Pot. Sulfate, basis 90% bgs ton	...	:	47.30
Pot. & Mag. Sulfate basis 48% bags ton	...	:	27.60
Manure Salts basis 30% bulk ton	...	:	18.75
Manure Salts basis 20% bulk ton	...	:	12.40
Kainit, basis, 12.4% bulk ton	...	:	9.00
Kainit, basis, 14% bulk ton	...	:	9.50
tons 10%			
Bulk in bags $2.00 extra			
Prices cif. Atlantic&Gulf Ports			
POTASSIUM Acetate, USP, 100 lb kegs lb	.29	:	.30
Bicarbonate USP 320 lb bbls lb	.09	:	.09½
Bichromate, crys., 725 lb cnks lb	.08¼	:	.08⅝
Powd., 725 cnks wks lb	.12	:	.12½
Binoxalate, 300 lb bbls lb	.16	:	.17
Import, 112 lb bbls lb	.18	:	.19
Bisulfate, 100 lb kegs lb.	...	:	.30
BROMIDE, USP, cryst, gran, 100 lb bbls lb	.48	:	.49
Imported, USP, 220 lb cs lb	.38	:	.41
CARBONATE, 80-85% calc. 800 lb cks lb	.05⅝	:	.05⅝
80-85% hydrated cks lb	.05⅝	:	.05½
90-95 calc. casks lb	.06¼	:	.06½
96-98% calc. casks lb	.06¾	:	.07
99% calc casks lb	...	:	.07½
USP 100 lb kegs lb	.11	:	.11½
99% CP, casks lb	...	:	.12½
Chlorate cryst powd 112 lb kegs wks lb	.08½	:	.09
Imp., 112 lb NY lb	.08¼	:	.08½
Gran. Imp., 112 lb kegs NY lb	.10½	:	.11
Chloride, crys., bbls lb	.05⅝	:	.05½
Chromate, kegs lb	.27	:	.28
Citrate, USP, 50 lb lb	...	:	.60
Cyanide 110 lb cases lb	.55	:	.57½
Metabisulfite, 300 lb bbls lb	.11½	:	.12
Imp., 550 lb bbls lb	.11½	:	.12
Nitrate, see Saltpetre			
Oxalate, neutral, 225 lb bbls lb	.16	:	.17
Pyridine, 50gal drs gal	1.00	:	1.25
PERMANGAN, USP, crys., 500 lb & 100 lb drs wks lb	.14¼	:	.14½
Imp., 113 lb drs lb	.13½	:	.14
Prussiate red, 112 lb kegs lb	.37½	:	.38
Prussiate, yellow 500 lb casks lb	.18	:	.18½
Tartrate, neutral 100 lb kegs lb	...	:	.51
Titanium Oxalate, 200 lb bbls lb	...	:	.25
Pyridine, 50 gal drs. gal	2.25	:	2.30
QUICKSILVER, see Mercury			
Quinone, 100 lb kegs lb	1.75	:	2.25
R SALT, 250 bbls wks lb	.45	:	.46
Red Lead, See Lead Oxide			
Rochelle Salt, USP, 225 lb bbls lb	.20	:	.20½
Imp., USP, 300 lb bbls lb	.19	:	.19½
Sal Ammoniac, see Ammon. Chloride			
Sal Soda, see Sodium Carbonate			

OILS AND FATS

Castor Oil—During the month under review there has been a general reduction in price of ½c lb. on all grades and at the moment the market is steady and quoted at 14c lb. for No. 1 and 13½c lb. for No. 3. Consuming interest is up to average.

Chinawood Oil—Having touched its peak at about the middle of last month, the market is gradually easing off and it is now possible to buy spot oil in barrels at 25½c @26c lb. May-June shipment from the Coast in tanks is sharply lower at 20c@20½c lb. according to position. Consuming interest has revived a bit with the prices coming down.

Corn Oil—In most directions the market has advanced a bit over the week following the brace in crude cotton oil and the market at the mills in tanks is quoted at 7⅜c@ 7½c lb. for crude oil, with refined oil at unchanged levels.

Cottonseed Oil— Minor fluctuations have marked the activity in refined cotton oil over the month and at the moment the spot market is in much the same position as it was a month ago being quoted at 9.00c lb. for spot. On the whole, in spite of the flood situation, the market has not a firm tone. Crude is in a better position than at any time during the month with all sections asking 7¾c@8c lb. for their offerings.

Greases—On a generally firm market which has shown little change for the past several weeks, prices remain the same this week and are quoted at 9½c lb. for choice white; and yellow and house at 6¾c lb.

Lard Oil—The market has gradually declined over the month and at the moment the spot market is named at 13c lb. for off prime; 11¾c lb. for extra; 11c lb. for extra No. 1 and No. 1 and 10c lb. for No. 2.

Linseed Oil—Is showing more activity at moment than has been the case for sometime and the market has climbed over 11c

Salt, Common, see Sodium Chloride			
Salt Cake 94-96% c-l wks ton	19.00	:	20.00
White 87% wks ton	15.00	:	17.00
SALTPETRE, Double refined Granular, 450-500 lb bbls lb	.06⅛	:	.06¼
c-l wks lb	...	:	.06
Powdered, bbls c-l wks lb	...	:	.07¼
Large Crystals, bbls c-l wks lb	...	:	.08
Triple Refined Gran bbls wks lb	.06⅝	:	.06¾
Satin White, 500 lb bbls lb	...	:	.01½
SILICA Crude, bulk, mines ton	6.00	:	7.00
Refined, floated bags ton	15.00	:	30.00
Air floated bags ton	32.00	:	50.00
Extra, floated, bags ton	55.00	:	65.00
SILVER metal American oz. oz	...	:	.56¼
SODA ASH, 58% light bags delivered NY 100lbs	2.14	:	2.29
bbls., delvd. NY 100 lb	2.39	:	2.54
Contract, c-l,bgs,wks. 100 lb	...	:	1.32½
58% dense c-l bgs.wks.100 lb	...	:	1.32½
Spot 5c 100lbs differential			
CAUSTIC, 76% solid drums delv'd NY 100 lb	3.76	:	3.91
Ground & Flake 76% drums del., NY 100 lb	4.16	:	4.31
bbls del. 100 lb	4.41	:	4.56
Contract c-l wks 100 lb	...	:	3.00
Spot c-l wks 100 lb	...	:	3.10
Ground & Flake, 76%, Spot, wks c-l 100 lb	...	:	3.50
USP, stick, 10 lb cans lb	.19	:	.21
Pure, stick, by alcohol lb	.25	:	.27
Soda Sal. see Sodium Carbonate			
Sodium Metal, 12½ lb bricks lb	...	:	.27
SODIUM ACETATE, crys 450 lb bbls wks lb	.04½	:	.05
Aluminate, 500 lb bbls wks lb	.07½	:	.08
Aluminum Sulfate, see Alum Soda			
Arsenate, 4 lb mtl. wks drms gal	.50	:	.60
Drums, 8 lb material wks gal	1.00	:	1.20
Bicarbonate 400 lb bblsNY100 lb	...	:	2.41
Bbls c-l wks 100 lb	...	:	2.00
112 lb kegs c-l wks lb	...	:	2.25
112 lb kegs c-l wks 100 lb	...	:	2.25
Bichromate, 500 lb casks wks lb	.06¼	:	.06¾
Bisulfite, dry powder 500 lb bbls wks lb	...	:	.08½
Imported lb	...	:	.08
BROMIDE, USP, 100 lb cs lb	.48	:	.49
Imp. USP., 220 lb cases lb	.44½	:	.45
Carbonate 350 lb bbls NY 100 lb	1.30	:	1.35
Works c-l 100 lb	1.10	:	1.30
Monohydrate, 400 lb bbl 100 lb	...	:	2.40
Pure photographic 100 lb Imported, 112 lb kegs lb	.06¼	:	.06½
Chloride, tech ton	12.00	:	13.00
CP, 300 lb bbls lb	.05	:	.06
Chlorate, 112 lb kes wks lb	.06½	:	.06¾
kegs lb	.07	:	.08
Chromate, 800 lb bbl lb	...	:	.08
Cyanide 96-98% 100 & 250 lb drums wks lb	...	:	.20
c-l wks lb	...	:	.19
Imp., 95-97% 100 lb drs lb	.18	:	.19
Fluoride, 300 lb bbls wks lb	08¾	:	.09
Imp., 700 lb cks lb	09	:	.10
Hydroxide, see Soda Caustic			
Hypochlorite Soln 100 lb cbys lb	...	:	.05
14½ soln 50 lb cbys lb	...	:	.04
Hydrosulfite200 lb bbls fobwks lb	.22	:	.24
HYPOSULFITE, tech., pea crys 375 lb bbls., wks 100 lb	2.65	:	2.65
Bbls., c-l wks 100 lb	...	:	2.50
100 lb kegs wks 100 lb	2.80	:	2.90
Imp. 100 lb	2.75	:	3.00
Regular crys., bbls wks 100 lb	2.40	:	2.65
Bbls., c-l wks 100 lb	2.40	:	2.50
Kegs, wks 100 lb	2.35	:	2.45
Imp. 100 lb	2.35	:	2.45
Metanilate, 150 lb bbls lb	.70	:	.75
Molybdate, 100 lb kegs lb	...	:	1.10
Naphthionate, 300 lb bbls lb	.55	:	.57
Nitrate crude, 95% 200 lb bgs c-l NY 100 lb	...	:	2.60
May Shipment 100 lb	...	:	2.60
Double Refined 400 lb bbls Gran c-l wks lb	...	:	.03¾
Nitrite, 500 lb bbls spot mkrs lb	.08	:	.08¼
Imp., 650 lb casks lb	.08½	:	.08¾
Ortho - Chloro - Tolune Sulfonate 175 lb bbls wks lb	.25	:	.27
Oxalate, neutral, 100 lb kegs lb	.20	:	.23

Sodium Perborate
Tin Tetrachloride

Chemicals

Titanium Oxide
Degras

SODIUM (Continued)			
Perborate, 275 lb bbls	lb	.21	.22
Peroxide, 200 lb cases	lb	.23½	.24
Phosphate, di-sodium tech 550 lb Bbls	100 lb	3.25	3.55
Imp	100 lb	...	3.25
Mono-sodium 100 lb kegs	lb	.30	.31
Tri-sodium tech c-l bbls 100 lb		...	3.90
Picramate, 100 lb kegs	lb	...	.69
Para-Toluene Sulfonate 175 lb bbls	lb	.08	.09
PRUSSIATE, yellow 350 lb bbls			
wks	lb	.12	.12½
Imp., 50 lb cks	lb	.10½	.11
Pyrophosphate, 100 lb kegs	lb	.13½	.14
Salicylate, 100 lb kegs	lb	.37	.38
Silicate, 40° turbid, tanks wks	100 lb	...	.75
55gal drums wks	100 lb	.85	1.10
40° clear, tanks wks	100 lb	...	1.10
55gal. drs wks	100 lb	1.20	1.45
42° turbid tks., wks	100 lb	...	.80
55gal drs wks	100 lb	.90	1.15
42° clear, tanks wks	100 lb	...	1.25
55gal drs., wks	100 lb	1.35	1.75
Silicofluoride, 450 lb bbls NY	lb	.04½	.05
Stannate, 100 lb drums	lb	.48½	.49
Sulfanilate 400 lb bbls	lb	...	.16
Sulphate, see Glauber's Salt			
Sulfate, Anhydrous 550 lb bbls c-l wks	lb	.02¾	.02¾
Imp., 250 lb bbls	lb	.01¾	.02
Sulfide, 60% solid, 650 lb drs le-l wks	lb	.03¾	.04
Drs., c-l wks	lb	...	.03½
Imp., 700 lb drs NY	lb	.03	.03½
60% brkn. 650 lb drs wks	lb	.04	.04¼
Drs., c-l wks	lb	...	.03¾
30% crys 440 lb bbls wks	lb	.02½	.02¾
Imp., 400 lb bbls	lb	.02¼	.02½
Sulfite, cryst 400 lb bbls wks	lb	.03¼	.03½
Anhydrous USP, 100 lb kgs	lb	.08½	.09
Sulfocarbolate USP 100 lb kgs	lb	.32	.34
Sulfocyanide, 400 lb bbls	lb	.40	.45
Tungstate, cryst., 100 lb kegs	lb	.80	.82½
SOLVENT NAPHTHA, 110gal drs wks	gal	...	.46
8,000gal tank cars wks gal		...	.35
STRONTIUM, Bromide, USP, 50 lb kegs	lb	.51	.52
Carbonate, 600 lb bbls wks	lb	.07¼	.07½
100 lb kgs wks	lb	...	.08
Nitrate, 600 lb bbls NY	lb	.08	.08½
SULFUR Crude, fob mines	ton	18.00	19.00
Brimstone Broken Rock 250 lb bgs c-l	100 lb	...	2.05
Less c-l bbls NY	100lbs	2.35	2.55
Roll, 150 lb bgs c-l NY 100 lb		...	2.25
Less c-l bbls NY	100 lb	2.65	2.85
Flour, Heavy bgs c-l	100 lb	...	2.50
Light, 100% bags c-l 100 lb		...	2.60
Rubbermakers 100% 240 lb bbls, c-l bags NY 100 lb		...	2.60
Comm'l 99% c-l 150 lb bgs NY	100 lb	...	1.45
For Dusting c-l 99½% 100 lb bags NY	100 lb	...	2.40
Flowers 100% 135 lb bbls NY c-l	100 lb	...	3.45
Precipitated 125 lb bbls NY	lb	...	.17
Lac., 125 lb bbls NY	lb	...	.13
Sulfur Chloride, red, 700 lb drs wks	lb	.05	.05½
150 lb chys wks	lb	...	.06½
Yellow, 700 lb drs wks	lb	.03¼	.04¼
Sulfur Dioxide, 150 lb cyl	lb	.08	.08½
Extra Dry, 100 lb cyl	lb	.17	.19
Sulfuryl Chloride, 600 lb drs	lb	.68	.70
Tar Coke Oven, Tks., wks	gal	.07	.08
Water Gas, Tks., wks	gal	...	.08
Terra Alba No 1 300 lb bbls 100 lb		1.85	1.90
Tetralene, 50gal drs wks	lb	...	.20
Thiocarbanilid 170 lb bbls	lb	.22	.24
TIN, metal Strait, NY	lb	...	.68½
99% American NY	lb	...	.69
Bichloride, 50% sol'n. 100 lb bbls wks	lb	...	.20¼
Crystals, 500 lb bbls wks	lb	...	.48
100 lb kegs wks	lb	...	.48½
Oxide, 300 lb bbls wks	lb	...	.70
100 lb kegs wks	lb	...	.72
Recovered bbls	lb	...	.68
Tetrachloride, 100 lb drs wks	lb	...	.41

lb. for the first time in months. On a fairly good demand, crushers now quote 11.2c lb. on raw oil in carlots on spot and 11.8c lb. for 5 bbls. in warehouse. The Argentine flax market has been a factor in advancing the market here.

Neatsfoot Oil — Shows little change over the week with prices holding steady on a fairly active buying movement.

Oleo Oil—The past week has been marked by a better movement in both grades of oleo oil and at the moment prices are firm and higher at 12¾c lb. for No. 1 and 9½c lb. for No. 2.

Olive Oil—Activity both from the buying selling angles contiunes very routine with sales of denatured oil reported variously from $1.68@$1.75 gal. as to seller, position and quantity. Consumers are still holding back from buying in a sizeable way, but when they buy the market does not lack strength. Foots are in much the same position and offers are heard this week at 9⅛c @9¼c lb. on spot.

Perilla Oil—Still feels the effects of the high market on Chinawood and sales have been made this week at 16¼c@16½c lb. for spot barrels, with tanks on the Coast quoted at 14¼c@14½c lb. Consuming interest has subsided somewhat since the first rush for spot supplies.

Rapeseed Oil—Has been neglected for the past several weeks and while the market is holding steady at the quoted levels, consuming interest is very light.

Red Oil—Fairly active on spot with lower quotations prevailing than a month ago. Distilled in barrels is offered at 9c@9½c lb. with saponified at 9¼c@10c lb.

Soya Bean Oil—On a generally quiet market in all directions the spot situation is unchanged and tanks on the Coast are still obtainable at 9⅜c lb. for prompt shipment to New York.

Stearic Acid—A regular volume of business is reported with prices unchanged for the week but lower than last month at 11c lb. for double pressed and 13c lb. for triple pressed.

Tallow—A firm undertone is apparent in the market and sellers report a good interest with prices well

Titanium Oxide 200 lb bbls.	lb		.40
Pigment, bbls wks	lb	.13½	.14
Toluene, 350 lb bbls	lb	.90	.94
Toluene, 8,000gal tnk cars wks	gal	...	.35
110gal drs wks	gal	...	.40
Toluidine, Mixed, 900 lb drs wks	lb	.31	.32
Toner Lithol Red bbls	lb	.85	.90
Para Red bbls	lb	.75	.80
Toluidine	lb	1.75	1.80
Triacetin, 50gal drs wks	gal	3.60	3.90
Tribromphenol, 100 lb cases	lb	...	1.10
Triphenylguanidine	lb	.69	.73
Triphenyl Phosphate, 450 lb bbls	lb	...	.75
Tungsten, NY WO	unit	11.75	13.00
Ultramarine Blue	lb	.15	.25
Urea Pure, 112 lb cases	lb	.18	.20
Venetian Red	lb	...	.60
Vermilion Amer., 100 lb bags	lb	...	1.85
English kegs	lb	1.85	1.90
WHITE LEAD, see lead, white			
XYLENE, 3° 8,000 gal. tanks wks NY	gal	...	.55
5° tanks wks	gal	...	.45
10° tanks wks	gal	...	.38
Com'l tanks wks	gal	...	.36
Drum lots 5c gal higher			
Xylidine crude	lb	...	.35
Refined	lb	.38	.40
ZINC METAL, high grade slabs c-l NY	100 lb	...	6.50
Ammonium Chloride, powd 400 lb bbls	lb	...	.06¼
Carb., tech., bbls NY	lb	.09½	.10
USP, 100 lb kegs	lb	...	.20
Chloride, fused 600 lb drs wks	lb	...	.06
Drs., c-l wks	lb	...	.05¾
Granulated, 500 lb bbls wks	lb	.06¼	.06½
Imported, dr NY	lb	.06¼	.06¾
Solution 50% tnks wks 100 lb		...	3.00
Cyanide, 100 lb drs	lb	.40	.41
Dust, 100 lb tins wks	lb	...	.10
500 lb bbls kegs c-l wks	lb	...	.09
Oxide, Amer., bags wks	lb	.07⅜	.7⅝
Amer., 300 lb bbls wks	lb	.07⅝	.07⅞
French, 300 lb bbls wks	lb	.10⅜	.12⅜
Bbl c-l wks	lb	.10⅜	.12⅜
Bags c-l wks	lb	.10⅛	.12⅛
USP, 100 lb bbls c-l	lb	...	.14
10-25 bbl lots	lb	...	.15
5bbl lots	lb	...	.16
1bbl lots	lb	...	.17
Imported, white seal, bbls	lb	.12	.13½
Green seal, bbls	lb	.11½	.12
Red seal bbls	lb	.10½	.11
Stearate, USP, 50 lb bbls	lb	.30	.21
Sulfate, 400 lb bbls wks	lb	.03½	.03¾
Bbls c-l wks	lb	...	.03¼
USP, 100 lb bbls	lb	.08	.09
Sulfide, 500 lb bbls	lb	.30	.32
Sulfocarbolate, 100 lb kegs	lb	.29	.30

Oils & Fats

Castor, No. 1, 400 lb bbls	lb	.14	.14½
80 lb cases	lb	.15	.15½
No. 3	lb	.13½	.14
Blown, 400 lb bbls	lb		.18
China Wood bbls spot NY	lb	.25½	.26
Tanks, Spot NY	lb		nom.
Coast tanks—June	lb	.20	.21
Coconut Ceylon 375 lb bbls NY	lb	.09½	.09¾
8,000 gal tanks NY	lb	.08¼	.08¾
Cochin, 375 lb bbls NY	lb	.10	10¼
Tanks, NY	lb	...	.09¼
Manila bbls NY	lb	.09½	.09¾
Tanks NY	lb	.08⅜	.08¾
Tanks Pacific Coast	lb	.08	.08¼
Edible bbls NY	lb	.12	.12½
Cod Newfoundland, 50gal bbls	gal	.66	.68
Tanks, NY	gal	.59	.61
Cod Liver, see Cod Liver Oil under Chemicals			
Copra, bags	lb	.06	.06¼
Corn, ref. 375 lb bbls NY	lb	.13	.13½
Tanks	lb	.11¾	.12
Crude tanks mills	lb	.07¾	.08
Bbbls NY	lb	.09¾	.10
Cottonseed Crude mill		.07¾	.07¾
PSY, 100 bbls spot	lb	...	.09
June-Oct.	lb	.09⅜	.09⅝
White, 100 bbls lots NY	lb	...	.11½
Degras, Amer., 50gal bbls NY	lb	.04¼	.04½
English, light bbls NY	lb	.05¼	.05⅛
Brown, bbls NY	lb	.04⅝	.04¾

Degras
Turkey Red Oil

Oils & Fats

Albumen, Egg Edible
Glue

Degras, Eng.,light brn,bbls,NY..	lb	.04½	.04¾
Light brown bbls NY	lb	.04½	.04¾
Dark, bbls NY	lb	.03½	.04
Neutral, bbls NY	lb	.07½	.12
Moellon, bbls., NY	gal	...	.50
Greases choice white bbls NY...	lb	...	.09¼
Yellow	lb	...	.06¼
Brown	lb	...	.06¼
Herring, Tanks, Coast	gal	nom.	nom.
Horse, 375 lb bbls NY	lb	.10	nom.
Lard, prime steam bbls	lb	.13¾	.14
Compounds, bbls	lb	.13¾	.14
LARD OIL, edible prime	lb.	...	.15
Off prime bbls	lb	...	.13¼
Extra bbls	lb	...	.12¼
Extra, No. 1 bbls	lb	...	.11
No. 1 bbls	lb	...	.10¾
No. 2 bbls	lb	...	.10¼
LINSEED, raw c-l bbls spot	lb	...	11.2
Five bbls raw.	lb	...	11.8
Tanks, raw	lb	...	10.4
Bld., 5 bbl lot wks	lb	...	12.2
Dbl boiled 5 bbl	lb	...	11.7
May-June c-l wks		...	11.2
Menhaden, crude tanks Balt	gal	...	.47½
Light pressed, bbls NY	gal	.66	.68
Yellow pressed, bbls NY	gal	.69	.70
Extra bleached bbls NY	gal	.70	.72
Blown bbls NY	lb	...	.10
Mineral Oil, white, 50gal bbls	gal	.80	.90
Russian	gal	.95	1.00
Neatsfoot 20° ct., bbls NY	lb	...	.15¾
Pure bbls NY	lb	...	.12¾
CP bbls NY	lb	...	.15¾
Extrax bbls NY	lb	...	.11
No. 1 bbls NY	lb	...	.10¾
Oleo Oil, No. 1 bbls NY	lb	...	.11½
No. 2 bbls NY	lb	...	.09¼
No. 3 bbls NY	lb	...	.08¾
OLIVE, denatured bbls NY	gal	1.68	1.75
Edible, bbls NY	gal	...	2.15
Foots bbls NY	lb	.09¼	.09½
Shipments	lb	.09⅛	.09¼
Palm Lagos, 1,500 lb casks	lb	.08¼	.08½
Niger casks	lb	.07½	.07¾
Bonny Old Calabar casks	lb	...	nom.
Palm Kernel bbl NY	lb	.09½	.09¾
Casks	lb	.09	.09⅛
Peanut refined bbls NY	lb	.15½	.16
Crude, mills buyers' tks	lb	.10	.10¼
Crude, bbls NY	lb	.12	.12¼
Perilla, bbls NY	lb	.16¼	.16½
Tanks, Coast	lb	.14¼	.14½
Poppyseed, bbls NY	gal	1.70	1.75
Rapeseed bbls NY Japanese	gal	.82	.83
English	gal	.90	.93
Blown bbls NY	gal	1.02	1.05
Red Oil, distilled bbls	lb	.09	.09½
Tanks	lb	...	.08¼
Saponified, bbls	lb	.09½	.10½
Tanks	lb	...	.08½
Salmon, 8,000 gal tks Coast	gal	.50	nom.
Sardine, Tanks Pacific Coast	gal	...	.45
Sesame edible yellow bbls	lb	.12¾	.13½
White	lb	.14	.15
Sod Oil, bbls NY	gal	...	.40
SOYA BEAN, crude tks Pac Ctst.	lb	.09⅝	.09¾
Crude, tks NY	lb	.10¼	.10½
Crude, bbls., NY	lb	.12	.12¼
Refined bbls NY	lb	...	.13
Sperm, 38° ct., blchd. bbls NY	gal	.85	.86
45° cold test blchd bbls NY	gal	.82	.84
STEARIC ACID,			
Double pressed, bags dist.	lb	.11¼	.11½
Double pressed, bgs saponified	lb	.11½	.12
Carlots	lb	...	.11
Triple pressed bgs dist	lb	.13¼	.13½
Carlots	lb	...	.13
Stearine Oleo bbls	lb	.09¼	.09¾
Tallow edible tierces	lb	...	.09½
Ctby, Extra loose	lb	...	.07¾
Tallow Oil, acidless tks NY	lb	...	.08¾
Bbls c-l NY	lb	...	.10½
Whale, nat winter bbls NY	gal	.76	.78
Blchd, winter bbls NY	gal	.78	.80
Extra blchd bbls NY	gal	.80	.82
Yolk Oil, bbls	lb		
Turkey Red, Oil, single bbls	lb	.11	.12
Double	lb	.14	.16

maintained at 7¾c lb. for City extra and 8½c lb. for edible.

INDUSTRIAL RAW MATERIAL

Albumen — Leading importers have reduced their prices on spot parcels to 90c@92c lb. for edible egg and 85c@87c lb. for technical. Lack of demand and somewhat better supplies on spot are responsible for the reduction. There has been little or no change in the Chinese position.

Bees Wax—Rather quiet at the moment with factors quoting unchanged prices on all grades.

Blood—With the end of the season at hand, consumers have practically lost interest in the market for the time being and only some very small replacement business is being done at $4.50 unit, New York Stocks are not large and the market is not expected to break.

Bone Meal— Business is rather routine on this market with South American steady at $29.00@$30.00 ton and domestic at $28.50@$29.00 ton.

Carnauba Wax—The spot market for yellow and No. 2 regular is stronger this week and the former is now held at 57c@58c lb. and the latter at 53c@54c lb. Consuming interest is none too good. The lower grades have not changed.

Divi Divi—Quiet here and for shipment with no offers heard at the moment and the market quoted nominally at $47.00@$48.00 ton.

Egg Yolk— Consuming interest has fallen off and what little stocks there are available on spot are lower at 80c@82c lb. as to seller. The shipment position has not been altered and the market is quite steady.

Gums, Varnish— Standard Batavia damar on spot continue as of outstanding interest with the market firm at 26¼c@26½c lb. There is some interest on kauri gum because of the tax which has been imposed, but otherwise varnish gums continue quiet and generally easy.

Japan Wax—Activity is rather limited at the moment and the spot market is held at 17¾c@18c lb. In the absence of any definite shipment price, it is believed that the

Industrial Raw Materials

Albumen, egg edible	lb	.90	.92
Tech., 100 lb drs.	lb	.85	.86
Blood, 225 lb bbls	lb	.45	.55
Vegetable edible	lb	.60	.65
Technical	lb	.50	.55
Annatto, fine	lb	.41	.48
Archil., double 600 lb bbls	lb	.13	.14
Triple, 600 lb bbls	lb	.16	.17
Cone, 600 lb bbls	lb	.18	.20
Asbestine c-l wks	ton	...	14.75
le-l wks	ton	...	18.00
Bees Wax, white cases	lb	.58	.60
Yellow, refined cases	lb	.46	.48
Crude, bags	lb	.40	.41
Commercial cs,	lb	.27	.28
Blood dried fob NY	unit	...	4.50
Chicago	unit	...	4.50
S Am Shipment	unit	...	3.90
Bone Raw Chicago	ton	29.00	30.00
Bone Meal, 3 & 50 imp	ton	30.00	31.00
Bone Ash, 100 lb kegs	lb	.06	.07
Black, 200 lb bbls	lb	...	.08¼
Candelilla Wax, bags	lb	.33	.35
Carnauba Wax, Flor., bags	lb	.50	nom.
Powd	lb	.50	nom.
No. 1, Yellow, bags	lb	.56	.58
No. 2, regular bags	lb	.53	.55
No. 2, N. Country bags	lb	...	nom.
No. 3, N Country bags	lb	.35	.37
No. 3, chalky bags	lb	.38	.40
CHARCOAL			
Hardwood, lump, bulk wks	bu	.18	.19
Wood, powd., 100 lb bbls	lb	.04	.05
Willow, powd 100 lb wks bbls	lb	.06	.06¼
Chestnut clarified 25% tks wks	lb	.02	.02¼
Bbls, wks	lb	.03	.03¼
Powd., 60% 100 lb bags wks	lb	.05½	.05¾
Decolorized bags wks	lb	.06½	.07
Cudbear, English	lb	.17	.18
Cutch Rangoon 100 lb bales	lb	...	.15
Tablets, 120 lb boxes	lb	.13	.14
Borneo solid, 100 lb bales	lb	.05½	.05¾
Cyanamide, bulk, c-l wks Amm	unit	1.82½	1.90
Imp. Amm.	unit	1.80	1.85
Dextrin, white corn 140 lb bags			
c-l 100 lb		...	3.87
bags c-l 100 lb		...	3.97
Canary 100 lb		...	3.92
bags le-l 100 lb		...	4.02
Potato, white 220 lb bags le-l	lb	...	.08½
Yellow, 220 lb bags	lb	...	.08½
Tapioca, 200 lb bags le-l	lb	.08	.08¼
Divi Divi Extract	lb	.04	nom.
Pods, bags ship	ton	47.50	48.00
EARTH Diatomaceous see Kieselguhr			
gg Yolk, 200 lb cs	lb	.80	.82
Ester Gums Dark, 280 lb bbls	lb	.13¾	.14
Light, 280 lb bbls	lb	.14	.14¼
Fish Scrap, dried wks	unit	4.50 &	.10
Acid Bulk f & 3½ Deliv Norfolk & Balt basis	unit	...	nom.
Flavine Lemon 55 lb cs	NLb	.90	.95
Orange 70 lb cs	lb	.85	.90
Fossil Flour	lb	.02½	.04
Fustic, solid 50 lb boxes	lb	.20	.23
Crystals, 100 lb boxes	lb	.20	.23
Liquid, 51° 600 lb bbls	lb	.09	.10
Fustic, sticks	ton	30.00	32.00
Chips	lb	.04	.05
Gall extract	lb	.20	.21
Gambier 25% liq.,450 lb bbls	lb	.12	.14
Common 200 lb cases	lb	.02	.09
Singapore cubes, 150 lb bags	lb	...	.23
Gelatin Technical 100 lb cs	lb	.45	.50
Glucose (Grape Sugar) dry 70°			
bags c-l NY 100 lb		3.14	3.24
80° bags c-l NY 100 lb		3.24	3.34
Tanners' Spcl 100 lb bgs 100 lb		...	3.14
GLUE, pure white bbls	lb	.23	.26
Medium white, bbls	lb	.20	.24
French bbls	lb	.18	.25
High Grade, bbls	lb	.35	.40
Bone, regular, bbls	lb	.10	.12
Fish bbls	gal	1.50	1.75
Hide bbls	lb	.14	.24

Gums
Oak Bark

Industrial Raw Materials

Osage Orange
Whiting

GUM, Accroides, Red, coarse and fine, 140-150 lb bags	lb	.03¼	.04½
Powdered, 150 lb bgs	lb	.06	.06½
Accroides, Yel. 150-200 lb bgs	lb	.18	.20
Animi (Zanzibar) Bean and pea 250 lb cases	lb	.40	.45
Glassy, 250 lb cases	lb	.60	.65
Asphaltum, Barbadoes, Manjak 200 lb bags	lb	.09	.12
Egyptian, 200 lb cases	lb	.15	.17
Gilsonite selects 150 lb bgs	ton	55.00	60.00
Benzoin, Sumatra, Tech., 120 lb cases	lb	.30	.32
Copal, Congo, 112 lb bags			
Water White,	lb	.35	.36
Light Amber,	lb	.12½	.14
Dark Amber,	lb	.08¾	.09
Clean Opaque	lb	.12	.13
Copal, East Indian 224 lb cases 180 lb bags—			
Pale, E. I. Bold	lb	.17	.17¼
Pale, E. I. Chips	lb	.07½	.08
180 lb bags—			
Copal, Manila, 180-190 lb Baskets—			
Pale Bold, Loba A,	lb	.16	.16½
Pale Bold, Nubs, Loba B	lb	.15	.15¼
Pale, Bold, Loba C	lb	.14½	.15
Pale Nubs, P. N.	lb	.14	.14½
Pale Bold, 224 lb cases	lb	.16	.18
Copal, Pontianak, 24 lb cases—			
Pale, Bold, genuine No. 1	lb	.28	.28½
Pale, genuine split chips	lb	.19	.19½
Damar, Batavia standard 136 lb cases	lb	.26½	.27
Batavia E Seeds 136 lb cs	lb	.18½	.19
Batavia F Splinters 136 lb cases and bags	lb	.12	.13
Batavia, Dust, 160 lb bags	lb	.10½	.11¼
Singapore No. 1 224 lb cs	lb	.34	.36
Singapore No. 2, 224 lb cs	lb	.22½	.23½
Singapore No. 3, 180 lb bgs	lb	.11	.11½
Elemi, No. 1, 80-85 lb cs	lb	.14	.15
No. 2, 80-85 lb cases	lb	.13	.14
No. 3, 80-85 lb cases	lb	.11	.13
Kauri No. 1, 224-226 lb cs	lb	.67½	.68
No. 2, fair pale 224-226 lb cases	lb	.44½	.45
Bush Chips 224 - 226 lb cases	lb	.42	.43
Pale Chips 224-226 lb cases	lb	.24½	.26
Brown Chips 180-200 lb bgs	lb	.14½	.16
Sandarac Prime quality 220 lb bags and 300 lb casks	lb	.25	.26
Graphite crude 220 lb bags	ton	15.00	35.00
Flake, 500 lb bbls	lb	.05	.09
HEMATINE, Paste, 500 lb bbls	lb	.09	.12
Crystals, 400 lb bbls		.12	.20
Hemlock, 25% 600 lb bbls wks	lb	.03½	.03¾
Bark	ton		16.00
Hyperne, 51° 600 lb bbls	lb	.12	.15
Indigo Madras bbls	lb	1.28	1.30
20% paste drums	lb	.14	.15
Japan Wax 224 lb cs	lb	.17¾	.18
KIESELGUHA, 95 lb bags NY	ton	60.00	70.00
Larch 25% 600 lb bbls wks	lb	.03¾	.04
Powd., 100 lb bags wks	lb	.08	.09
Logwood 51° 600 lb bbls	lb	.08¼	.08½
Lower grades	lb	.07½	.08
Solid, 50 lb boxes	lb	.12	.15
LOGWOOD sticks	ton	26.00	27.00
Chips 150 lb bags	lb	.03	.03½
Madder, Dutch	lb		.30
Mangrove, 55% 400 lb bbls	lb	.03½	nom.
Mangrove bark, African	ton	37.00	38.00
Marble Flour, bulk	ton	10.00	12.00
See also Calcium Carbonate under Chemicals			
Montan Wax, crude bags	lb	.06½	.07
Bleached bags	lb	.24	.27
Myrobalans 25% liquid bbls	lb	.04	.04¼
50% solid, 50 lb boxes	lb	.08	.08¼
Myrobalans, bags J1	ton	41.00	42.00
R1	ton		nom.
J2	ton		35.50
Nitrogenous Material bulk	unit		3.60
NUTGALLS, Chinese, bags	lb	.17	.18
Aleppy bags	lb	.25	nom.
Powd. bags	lb	.22	.24
Oak bark, whole	ton	20.00	23.00
Ground	ton	45.00	50.00
Oak, tanks wks	lb		.03½
23-25% liq. 600 lb bbls wks	lb	.04	.04½
Solid, powd	lb	.07½	.08

above price would apply for prompt shipment.

Mangrove Bark—Has shown no change for weeks and is firmly held in all directions at $37.00@ $38.00 ton for shipment, with routine interest.

Myrobalans—J2's are a bit firmer at the moment with importers quoting $37.00 ton for shipment with some buying interest at this level. R2's are still nominal and J1's are quiet at the quoted levels.

Rosin—There is a fairly good buying inquiry noted on spot and the market on the dark grades has advanced for the week. At the primary markets, receipts have been very heavy, but sales have likewise been of good volume and the undertone is good. Current quotations are :B, $9.70; D, $9.75; E, $10.10; F, $10.20; G, $10.45; H, $10.45; I, $10.45; K, $10.50; M, $10.70; N, $11.10; WG, $12.25; WW, $13.25.

Sumac—Stocks are not large at the primary markets and shippers have advanced the price to $76.00 @$78.00 ton as to position.

Shellac—This market has been featured by spectacular rises on spot during the past few days owing to a shortage here as well as at the primary markets and prices are now at 48c lb. for T. N. and garnet; 52c lb. for superfine and 58c lb. for bone dry.

Tankage—Rather quiet with the end of the season at hand and the price is unchanged here in the East with some offers heard at $4.25 & 10c unit spot.

Turpentine — Holding quite steady this week with prices fractionally higher than was the case last week. A good consuming demand is in evidence and serves to hold the market steady despite heavy receipts at Southern seaboard ports. Current quotations are; 62c@68c gal.

Valonia—On the whole the market is still considered nominal for all grades for while there are some offers for shipment, interest here is very slight and the prices asked are not attractive at the moment.

Wattle Bark—With the new crop, stocks abroad are in better supply and shipment offers are heard this week at $49.50 ton with but slight interest here.

Osage Orange 51° liquid	lb	.07	.07½
Powd, 100 lb bags	lb	.14½	.15
Crystals	lb	.16	.17
Paracoumarone, 230 lb drums	lb	.12	.15
Paraffin, ref'd. 200 lb cs slabs			
118-120 deg. M.P.	lb	.08	.09
122-127 deg. M.P.	lb	.06½	.06¾
128-132 deg. M.P.	lb	.07½	.07¾
133-137 deg. M.P.	lb	.08	.08½
138-140 deg. M.P.	lb	.08¾	.10
Phosphate Acid, 16% Bulk wks	unit	.62½	.65
Phosphate Rock, fob., mines			
Florida Pebble 68%	ton	3.00	3.15
Florida Pebble 70%	ton	3.50	3.65
Florida Pebble 72%	ton	4.00	4.15
Florida Pebble, basis 75%-74%			5.00
Florida Pebble, 75%			5.75
Florida Pebble, basis 77%-76%			6.25
Tennessee, 72%	ton		5.00
Pine Oil, stm., dist, bbls	gal		.70
Destructive dist.	lb	.62	.64
Prime	bbl	8.00	10.00
Plaster Paris, tech., 250 lb bbls	bbl		3.30
Pumice Stone, lump, 250 lb bbls	lb	.04¼	.06
Lump, bags	lb	.04	.05
Powdered, 350 lb bbls	lb	.02½	.03
QUEBRACHO, 35% liquid tks	lb	.03	.03½
450 lb bbls c-l	lb	.03¾	.04
35% bleaching, 450 lb bbls	lb	.04	.05
Solid 63% 100 lb bales clf	lb	.04¼	.04¾
Clarified, 64% bales	lb		.05
Quercitron, 51° 450 lb bbls	lb	.06½	.07
Solid, 100 lb boxes	lb	.10	.13
Quercitron, bark, rough	ton		14.00
Ground	ton	34.00	35.00
Rosins (Solid in 600 lb bbls gross for net)			
B 9.70	I		10.90
D 9.75	K		10.90
E 10.25	M		11.00
F 10.40	N		11.25
G 10.75	WG		12.75
H 10.90	WW		13.75
(Sold in 600 lb bbls net, quotations based on a unit of 280 lb)			
Rosin Oil first run 50 gal bbls	gal		.57
Second run bbls	gal		.62
Rotten Stone lump imp. bbls	lb	.07	.08
Lump selected, bbls	lb	.09	.12
Powdered, bbls	lb	.03	.05
Domestic bags mines		24.00	30.00
Sage Flour 150 lb bags	lb	.04¼	.05
Shellac, T. N., bags	lb		.48
Superfine bags	lb		.52
Garnet, bags	lb		.48
Bone dry, bags	lb		.58
Spruce, 25% liquid tanks, wks	lb	.01	.01⅛
bbls	lb		.01¾
Powd, 50% 100 lb bags wks	lb	.02	.02¼
Starch, rice, 140 lb bags	lb	.09	.10
Powd. 140 bgs. c-l	100 lb		3.22
Bags lc-l	100 lb		3.32
Pearl, 140 lb bags	100 lb		3.12
Bags lc-l	10 lb		3.22
Potato domestic, 200 lb bgs c-l	lb	.04¾	.05
Imported bags duty paid	lb	.08¼	.08½
Wheat, dom., thick bags	lb	.06½	.07
Thin, bgs	lb	.09½	.10
Sol. Potato	lb	.08	.08½
Sumac, extract, liq 450 lb bbls	lb	.08	.09
CP., 450 lb bbls	lb		.10½
Stainless, 600 lb bbls	lb	.11	.11½
Sumac, Sicily leaves 100 lb bags	ton	130.00	nom.
Ground shipment	ton	76.00	77.00
Virginia, 150 lb bags	ton	55.00	60.00
TALC, Italian 220 lb bags NY	ton	40.00	50.00
Refined, white bags	ton	50.00	55.00
French, 220 lb bgs NY	ton	30.00	35.00
Refined, white bags	ton	38.00	45.00
Dom., crude, 100 lb bags NY	ton	12.00	15.00
Refined 100 lb bags NY	ton	16.00	18.00
Tankage, ground NY	unit	4.40	& .10
High grade fob Chicago	unit	4.50	& .10
So. Am. clf	unit	4.40	& .10
Tapioca Flour, high grade bgs	lb	.04½	.04½
Medium grade, bgs	lb	.03½	.03¾
Low grade, bags	lb	.03	.03¼
Tar, Kiln-burnt	bbl	15.50	16.00
Retort bbls	bbl	16.00	16.50
Tripoli 500 lb bbls	100 lb	2.50	3.00
Turpentine Spirits bbls	gal	.62¾	.68
Wood steam Dist. bbls	gal	.52¾	.58
Valonia Cups 30-31% tan	ton		49.50
Beard, 42% tan bags	ton		68.00
Mixture Bark bags	ton		Nom
Wattle Bark, bags	ton	50.00	51.00
Extract 55% dble bgs ex-dock	lb		.05¾
Whiting 200 lb bags c-l wks	100 lb		1.25
Alba bags NY c-l	ton		13.00
Gilders, bags NY c-l	100 lb		1.35

Import Manifests

Heavy Chemicals and Other Industrial Raw Materials.

IMPORTS AT NEW YORK
May 3 to 10

ACIDS—Stearic, 40 bgs., C R Spence & Co., Rotterdam

ALCOHOL—Denatured, 50 drs., C Esteva, Humacao

ALUMINUM POWDER—5 cs., A C Rempert & Co., Hamburg

AMMONIUM SALTS—Carbonate, 9 cases, Standard Bank of So Africa, Liverpool; **Muriate,** 25 cks., C De P Field Co., Bristol; **Nitrate,** 266 cks., R W Greeff & Co., Oslo; 109 cks., Kuttroff Pickhardt & Co., Hamburg; 91 cks.. R W Greeff & Co., Oslo; **Phosphate,** 39 cks., Roessler & Hasslacher Chem Co,, Antwerp

ANTIMONY—Crude, 350 cs., Wah Chang Trdg Co., Hankow; **Regulus,** 750 cs., Caldbeck MacGregor, Shanghai; 1,298 cs., Wah Chang Trdg Co., Hankow; 250 cs., Chase Nat Bank, Hankow; 750 cs., Mitsui & Co., Hankow; 250 cs., Order, Hankow

ARSENIC—1,102 brls., Cie Minerva Asarco, Tampico

BARIUM—Carbonate, 1 brl., Hensel Bruckmann & Lorbacher, Hamburg; **Nitrate,** 33 cks., Monmouth Chem Corp., Rotterdam

BEANS—Castor, 167 bgs., W & A Leaman Co., Port De Paix; 12,293 bgs., Volkart Bros., Coconada; 14,260 bgs., Volkart Bros., Bombay; 14,938 bgs., Ralli Bros., Bombay

CALCIUM—Chloride, 1 cse., Hensel Bruckmann & Lorbacher, Hamburg

CASEIN—250 bgs., T M Duche & Sons, London; 3,086 bgs., Lee Higginson & Co., Buenos Aires; 417 bgs., National City Bank, Buenos Aires

CHALK—350 bgs., H J Baker & Bro., Bristol; 1,000 bgs., Chatham & Phenix Nat Bk., Antwerp; 100 brls., Chatham & Phenix Nat Bank, Oslo; 250 tons, Taintor Trad Co., London; 2,000 bgs., National City Bank, Antwerp; 800 tons, J W Higman Co., Dunkirk; 1,000 tons, Kidder Peabody Co., Dunkirk

CHEMICALS—25 cks., 5 cs., Pfaltz & Bauer, Hamburg; 500 kegs, Equitable Trust Co., Hamburg; 1 cse., A Hurst & Co., Genoa

CINCHONIDINE—22 cs., R W Greeff & Co., Rotterdam

CLAY—18 cks., J Goebel & Co., Bremen

COAL TAR DISTILLATE—47 drs., West Disinfecting Co., Glasgow

COLORS—23 cs., Lamanna Azema & Farnam, Havre; 1 cse., B F Drakenfeld Co., Bremen; 1 cse., O Hommel Co., Bremen; 3 cs., Ravor Ruhl & Co., Bremen; 2 cs., F L Kraemer & Co., Bremen; 1 cse., 2 cks., General Dyestuff Corp., Hamburg; 10 cs., R F Downing & Co., London; 4 brls.. American Exchange Irving Trust Co., Genoa; 6 cks., Fezandie & Sperrle, Antwerp; 2 cks.. American Exchange Irving Trust Co., Antwerp; 3 cs., B Bernard, Genoa; 2 cs., R F Downing & Co., Havre; 61 cks.. Ciba Co., Havre; 49 pgs., Sandoz Chem Works, Havre; **Bronze Powder,** 12 cs., L Uhlfelder & Co., Bremen; 2 cs.. Hensel Bruckmann & Lorbacher, Bremen; 3 cs., Baer Bros., Hamburg; **Earth,** 49 cks., Fezandier & Sperrle, Bremen

DISODA PHOSPHATE—205 cks., Rhodia Chem Corp., Rotterdam

EARTH—Red, 60 cks., Reichard Coulston Inc, Bristol; 59 cks., Order, Bristol

EXTRACTS—Berry, 5 cks., Geigy Co., Hamburg; **Quebracho,** 2,973 bgs., J C Andresen Co., Buenos Aires; 508 bgs., First Nat Bk Boston, Buenos Aires; 3,050 bgs., Order, Buenos Aires; **Rosewood,** 1 bale, Toledano Exp Co., Manaos

FFRRO PHOSPHOR—110 cs., C W Leavitt & Co., Dunkirk

FULLER'S EARTH—450 bgs., L A Salomon & Bros., London

GALLNUTS—120 bgs., E E Androvette, Shanghai

GELATINE—24 cs., DuPont Pathe Film Mfg Co., London

GLAUBER SALTS—125 bls., Monmouth Chem Corp., Hamburg

GLUE—2 cs., 284 brls., 87 cks., M Miller, Antwerp; 100 bgs., 169 brls., British Bank of So America, Antwerp; 124 bls., British Bank of So America, Antwerp; 50 cks., M Miller, Antwerp; 400 bgs., S Isaacs, Trieste; 304 bgs., W E Miller, Havre; 27 bgs., Rex & Reynolds, Havre

GLYCERINE—92 drs., Colgate & Co., Rotterdam; 58 drs., Procter & Gamble, Havana; 41 drs., S Sebates & Co., Havana; 20 drs., Brown Bros & Co., London; 20 drs., Parsons & Petit, Rotterdam

GUMS—Arabic, 263 bgs., T M Duche & Sons, Port Sudan; 210 bgs., Barclays Bk., Port Sudan; 887 bgs., Nat Bank of Egypt, Port Sudan; 250 bgs., T M Duche & Sons, Port Sudan; **Chicle,** 101 bgs., Chicle Development Co., Vera Cruz; 140 bls., Mexican Exploration Co., Progreso; **Copal,** 500 bgs., Paterson Boardmann & Knapp, Antwerp; 137 bkts., G H Lincks, Macassar; 220 bkts., W. H. Scheel Co., Macassar; 672 bkts., France Campbell & Darling, Macassar; 135 bkts., 234 bgs., M L Norden, Macassar; 1,110 bgs., Innes & Co., Macassar; 203 bkts., Gravenhorst & Co., Macassar; 123 bgs., 135 bkts., S Winterbourne, Macassar; 1,100 bgs., A Klipstein & Co., Antwerp; 30 bgs., S Winterbourne, Antwerp; 200 bgs., Innes & Co., Antwerp; 15 bgs., L C Gillespie & Sons, Antwerp; 10 bgs., Brown Bros & Co., Antwerp; **Damar,** 100 cs., Innes & Co., Batavia; 100 cs., Brown Bros & Co., Batavia; 100 cs., Kidder Peabody Acceptance Corp., Batavia; 200 cs., W Schall & Co., Batavia; 100 bgs., Bank of Manhattan Co., Batavia; 400 cs., National City Bank, Batavia; 400 cs., Order, Batavia; 269 bgs., Brown Bros & Co., Batavia; 338 bgs., Grace Nat Bank, Batavia; 77 bkts., Paterson Boardmann & Knapp, Macassar; 89 bkts., M L Norden, Macassar; 76 bkts., France Campbell & Darling, Macassar; **Hashab,** 125 bgs., National Gum & Mica Co., Port Sudan; 200 bgs., T M Duche & Sons, Port Sudan; 250 bgs., Thurston & Braidich, Port Sudan; 315 bgs., Orbis Products Trdg Co., Port Sudan; 100 bgs., Brown Bros & Co., Port Sudan; 868 bgs., Order, Port Sudan; **Tragacanth,** 8 cs., Thurston & Braidich, London; 43 cs., Orbis Products Trdg Co., London

IRISH MOSS—10 bls., C H Reisig, Havre; 13 bgs., Innis Speiden & Co., Havre

IRON OXIDE—12 cks., 12 brls., Reichard Coulston Inc., Liverpool

LAMP BLACK—75 brls., Stanley Dogett Inc., Antwerp

LEAVES—Patchouli, 73 bls., D L Silverman, Penang

LITHOPHONE—600 cks., B Moore Co., Rotterdam

MAGNESIA—Calcined, 10 cs., Shofield Donald Co., Liverpool

MAGNESITE—20 cks., 50 bgs., A Kramer & Co., Rotterdam

MANGANESE ORE—718 bgs., Kelly & Tennant, Santiago; 2,045 bgs., Brown & Roese, Santiago; 2,000 pkts., F Samuels & Co., Ponce

MINERAL WHITE—97 cks., African Metals Corp., Antwerp

MYROBALANS—4,120 pkts., National City Bank, Calcutta

NAPHTHALENE—94 bgs., White Tar Co., Antwerp; 500 bgs., Order, Dunkirk

NICKEL SULFATE—100 cks., Gallagher & Ascher, Havre

OILS—Cod, 50 cks., 50 brls., E M Javitz & Son, Copenhagen; 50 cks., Order, Copenhagen; **Cod Liver,** 100 brls., J Munroe & Co., Hamburg; 120 cks., 100 brls., Order, Oslo; **Olive,** 50 drs., H W Peabody & Co., Marseilles; 62 cs., Garneau & De Bruyn, Marseilles; 100 cs., G Debruyn, Genoa; 350 cs., La Montagne Inc., Southampton; 140 cs., S Canizzaro, Genoa; 200 cs., S Galle & Co., Genoa; 200 cs., F M Ferrari, Genoa; 100 cs., B Mandel & Co., Genoa; 150 cs., A Germano & Son, Genoa; 200 cs., G Rossano & Bros., Genoa; 150 cs., F Romeo & Co., Genoa; 1,000 cs., I F Roncallo, Genoa; 120 cs., P Pastene & Co., Genoa; 100 cs., F Bonomo & Co., Genoa; 250 cs., Busalacchi Bros., Genoa; 125 cs., Hirsch Bros., Genoa; 100 cs., Conte Verde Olive Oil Co., Genoa; 140 cs., J Solari & Co., Genoa; 150 cs., Buonocore & Son, Genoa; **Palm,** 240 drs., I R Boody & Co., Liverpool; 310 brls., Van Loemen Boonkamp & Co., Belawan; 146 brls., Order, Belawan; **Rapeseed,** 50 drs., F Frances:oni, Rotterdam; **Wood,** 165 brls., Guaranty Trust Co., Hamburg

OZOKERITE—4 bgs., Asco Chem Co., Hamburg

OXGALL—26 cks., H J Baker & Bro., Buenos Aires

PHOSPHOROUS RED—20 cs., P Bauer & Co., Antwerp

PLUMBAGO—96 bls., H P Winter & Co., Colombo; 72 bls., Bank of America, Colombo; 143 brls., Nat City Bank, Colombo

POTASSIUM SALTS—Chlorate, 1,400 cks., Monmouth Chem Corp., Hamburg; **Muriate,** 950 bgs., Potash Imptg Corp., Hamburg; **Sulfate,** 200 bgs., Potash Imptg Corp., Hamburg

QUICKSILVER—38 flasks, Haas Bros, Vera Cruz; 25 flasks, Heyden Chem Co., Vera Cruz; 25 flasks, Poillon & Poirier, Vera Cruz

SAL—Ammoniac, 128 cks., Superfos Co., Rotterdam

SHELLAC—67 bgs., A Hurst & Co., Hamburg; 500 bgs., Ralli Bros., London; 897 bgs., Ralli Bros., Calcutta; 400 bgs., Order, Calcutta; 100 bgs., First Nat Bank Boston, Calcutta; 300 bgs., Maclac & Co., Calcutta; 75 bgs., W Zinsser & Co., Calcutta; 109 chests, Rogers Pyatt Shellac Co., Calcutta; 1,100 bgs., Order, Calcutta; **Garnet,** 200 bgs., Order, Calcutta; 800 cs., Rogers Pyatt Shellac Co., Calcutta

SILVER SULFIDE — 56 seroons, Watson Geach & Co., Antofagasta

SODIUM SALTS—Carbonate, 10 cs., A Bourjois Co., London; **Hydrosulfite,** 20 kegs, General Dyestuff Corp., Liverpool; **Nitrate,** 2,464 bgs., R W Greeff & Co., Oslo; 9,741 bgs., W R Grace & Co., Iquique; 508 bgs., Kuttroff Pickhardt & Co., Hamburg; **Nitrite,** 21 cks., R W Greeff & Co., Oslo; 1 cse., Burroughs Wellcome Co., London; **Sulfite,** 50 drs., R F Downing & Co., Bristol; **Sulfate,** 71 cks., T Goldschmidt Inc., Rotterdam; **Superphosphate,** 2 brls., Hensel Bruckmann & Lorbacher, Hamburg

SULPHUR—5 cks., McKesson & Robbins, Bristol

TAPIOCA FLOUR—313 bgs., Catz American Corp., Batavia; 3,344 bgs., National City Bank, Batavia; 1,409 bgs., Order, Batavia; **Seed,** 171 bgs., National City Bank, Sourabaya

TEA WASTE—788 bgs., Maywood Chemical Works, Calcutta; 700 bgs., Citro Chemical Co., London; 400 bgs., Photo Agency Co., Calcutta

ULTRAMARINE BLUE—10 cks., Stanley Doggett Inc., Antwerp

WAX—Bees, 2 bgs., Schutte & Focke, Pto Plata; 237 bls., M Argueso & Co., Tampico; 6 bgs., W Schall & Co., Santo Domingo; 9 bgs., E A Canalizo & Co., Santo Domingo; 3 bgs., Kidder Peabody & Co., Pto Plata; 40 bgs., W R Grace & Co., Coquimbo; 48 bgs., W R Grace & Co., Valparaiso; 10 bgs., R Desvernine, Havana; 155 bls., Order, Genoa; 2 bgs., Schauman & Co., Humacao; **Carnauba,** 468 bgs., S P Drummond, Ceara; 123 bgs., Strohmeyer & Arpe, Ceara; 206 bgs., J Munroe & Co., Ceara; 11 bgs., Guaranty Trust Co., Ceara; 173 bgs., Order, Ceara; **Ceresin,** 12 bgs., Asco Chem Co., Hamburg

WHITING—500 bgs., Reichard Coulston, Antwerp; 5,600 bgs., Taintor Trdg Co., Antwerp; 1,000 bgs., Hammill & Gillespie, Rotterdam; 1,500 bgs., Scott L Libby Corp., Rotterdam; 357 bgs., J H Nicholas, Dunkirk

ZINC—Chloride, 22 drs., Order, Hamburg; **Oxide,** 50 brls., Reichard Coulston, Antwerp; 70 brls., Orbis Products Trdg Co., Marseilles

IMPORTS AT PHILADELPHIA
Apr. 27 to May 4.

ACID—Formic, 100 demijohns, Order, Hamburg; 74 carboys, Kali M[illegible] Co.

AMMONIA—Nitrate, 348 csks., Order, Hamburg.

BARYTES—100 bgs., Order, Rotterdam.

BAUXITE—7700 tons, Order, Sebenico.

CHEMICAL PREPARATIONS—1 cs. Franklin Fourth St. Nat. Bank, Havre.

CHEMICALS—25 bbls., A. Klipstein & Co., Bremen; 11 cs., Order, Hamburg; 160 drms., Order, Hamburg; 35 csks., Roessler & Hasslacher Chem Co., Rotterdam; 23 csks.,

Order, Rotterdam; 10 bbls., Order, Hamburg.
CHLORATE—Kalium, 3600 csks., American Exchange Irving Trust Co., Hamburg.
CLAY—100 tons, J. W. Hampton, Jr. & Co., Bristol; 150 tons, Moore and Munger, Bristol; **China**, 3503 tons, Various Consignees, Fowey; **Common Blue**, 231 tons, 5 cwt., Various Consignees, Fowey; **Ground China**, 240 tons, 19 cwt., Various Consignees, Fowey; **Sagger**, 149 tons, 18 cwt., Various Consignees, Fowey.
EARTH—Fullers, 50 bgs., L. A. Salomon & Bro., Bristol.
FLUORSPAR—2 bgs., Medvale Co. Liverpool.
GLUE—Bone, 500 bgs., Order, Rotterdam.
GLYCERINE—20 csks., Order, Marseilles; 9 csks., Order, Marseilles; 190 csks., Order, Marseilles; 80 csks., Order, Marseilles; 79 csks., Order, Marseilles.
WOOL GREASE—50 bbls., T. S. Cooper & Co., Bremen.
MAGNESIUM — Chloride, 167 drms., Order, Hamburg; 184 drms., Brown Bros. & Co., Hamburg.
MAGANESE—Silico, 52 bbls., Order, Genoa.
MOLASSES—810,000 gals. Chas. Kurz & Co., Inc., Havana; **Blackstrap**, 613,227 gals., N. American Trading & Import Co., Tampico.
NAPHTHALINE—5 bgs., Order, Rotterdam.
NITRATE—Thorium, 25 cs., Continental Bank, Hamburg.
OIL—Olive, 6 cs., Morris Friedman, Naples; 350 cs., Order, Leghorn; 460 cs., Order, Genoa; 100 cs. Order, Genoa; **Palm**, 38 csks., African and Eastern Trading Co., Inc., Hamburg; **Sulfur Olive**, 100 bbls., Leghorn Trading Co., Leghorn.
ORE—Iron, 500 bbls., C. K. Williams & Co., Malaga.
OSSEINE—2027 bgs., Order, Havre.
PEAT MULL—210 bbls., Atkins and Durbrow, Bremen.
POTASH—Caustic, 50 drms., Order, Hamburg; 162 drms., Brown Bros. & Co., Hamburg; **Muriate**, 300 bgs., Potash Importing Co., Hamburg; **Nitrate**, 200 bgs., Order, Dunkirk; 100 bbls., Order, Dunkirk.
QUEBRACHO LOGS — 1500 tons, Tannin Corp., Santa Fe.
SALTS—Epsom. 50 bbls., Order, Hamburg; 200 kgs., Order, Hamburg.
SEED—Rape, 165 bgs., Order, Rotterdam.
SODIUM—Cyanide, 400 drms., Order, Liverpool; **Nitrate**, 86,190 bgs., E. I. Du Pont de Nemours & Co., Iquique; 102 csks., Order, Hamburg; **Phosphate**, 32 csks., Order, Rotterdam.
TALC — 250 bgs., L. A. Salomon & Bro., Genoa.
ZINC—Chloride, 35 drms., Order, Hamburg.

IMPORTS AT BOSTON
April 24 to 30

ACID—Formic, 30 carboys, Order, Bremen.
ANTIMONY—30 bbls, Order, Bremen.
MAGNESITE — Calcined, 172 bbls., Brown Bros. Co., Rotterdam.
MAGNESIUM — Chloride, 148 drs., Brown Bros., Co., Rotterdam.
POTASH—Carbonate, 14 cks., I. M. Sobin, Rotterdam.
SODIUM—Bisulfite, 41 drs., Order, Rotterdam; **Sulfide**, 105 drs., I. M. Sobin Co., Rotterdam.

IMPORTS AT BALTIMORE
April 29 to May 5

ACID, Stearic, 20 bags, W. G. N. Rukert, Blydendijk, Rotterdam
BARYTES, 1,000 bags, Roessler & Hasslacher Chemical Co., Blydendijk, Rotterdam.
CHALK—Precipitated, 125 bags, H. J. Baker & Bro., New York, Wheatmore, Liverpool.
CHEMICALS—1500 bags, Paul Uhlich & Co., Inc., Blydendijk, Rotterdam; 500 bags, Paul Uhlich & Co., Inc., Blydendijk, Rotterdam; 15 casks, 7436 lbs., Baltimore and Ohio Railroad, France Maru, Hamburg.
CHLORINE SOLUTION—12 tins, 2510 lbs., John S. Conner, William Campion, Hamburg.
CLAY—Burnt, 210 bags, 15 tons, H. A. Robinson & Co., Inc., Bannack, Liverpool.
EPSOM SALT—500 bags, 110000 lbs., William H. Masson, Franco Maru, Hamburg.
FERRO-MANGANESE — 100 tons, Crocker Bros., Inc., New York, Wheatmore, Liverpool.
IRON—Chloride, 35 casks, 24675 lbs., William H. Masson, France Maru, Hamburg; **Oxide**, 5 sacks, E. M. & F. Waldo., Inc., Wheatmore, Liverpool.
LIMESTONE—8,000 tons, Bethlehem Steel Corp., Firmore, Felton.
MAGNESIUM—Powdered, 6 casks, 3553 lbs., John S. Conner, William Campion, Hamburg.
MOLASSES—1,300,000 gals., Cuba Distilling Co., Catahoula, Cienfuegos.
OIL—Castor, 10 bbls., 4710 lbs., Island Export Co., William Campion, Hamburg; **Harlem**, 1 bx., Muth Bros & Co. Blydendijk, Rotterdam.
ORE — Iron, 11,000 tons, Bethlehem Steel Corp., Santore, Daiquiri; 9,000 tons, Bethlehem Steel Corp., Berwindmoore, Daiquiri; 20,000 tons, Bethlehem Steel Corp., Marore, Cruz Grande; **Manganese**, 6,454 tons, Bethlehem Steel Corp., Millpool, Poti; 2, 976 tons, Carnegie Steel Co., Steel Voyager, Calcutta.
PEAT MOSS—50 bales, Cordillora Commercial Co., Inc., Blydendijk, Rotterdam.
POTASH—Carbonate, 129 bbls., 117,471 lbs., Tunis Speiden & Co., William Campion, Hamburg; 94 casks, 59,336 lbs., Parsons & Petit, Denderah, Hamburg.
CAUSTIC — 98 drums, William H. Masson, Blydendijk, Rotterdam; 451 drums, 105,677 lbs., Brown Bros., William Campion, Hamburg.
KAINIT—499400 lbs., Potash Importing Corp., Denderah, Hamburg
MURIATE—2000 bags, 401896 lbs., Potash Importing Corp., Denderah, Hamburg, 1000 bags, 200948 lbs., Potash Importing Corp., France Maru, Hamburg; 1000 bags, 200948 lbs., W. F. H. Shallus Co., France Maru, Hamburg; 1000 bags, 200,948 lbs. Potash Importing Corp., France Maru, Hamburg.
SALT—Brown, 250 bags, 25 tons Baltimore & Ohio Railroad, Bannack, Liverpool.
THORIUM AND SERIUM NITRATE—389 casks, 183,371 lbs., Kuttroff, Pickhardt & Co., William Campion, Hamburg.
WOOL GREASE—160 bbls., 75937 lbs., Samuel Shapiro & Co., Denderah, Hamburg.

IMPORTS AT SAN FRANCISCO
Apr. 23 to 30

AMMONIUM—Nitrate, 300 bbls., Order, Hamburg.
CHEMICALS — 25 casks, Braun, Knecht & Heiman, Hamburg; 46 drums, L. H. Butcher, Hamburg.
COPRA MEAL—2240 sacks, S. F. Milling Co., Manila.
BLOOD DRIED—755 bags, Foreign Trade Corp., Buenos Aires.
EPSOM SALTS—100 cks., Bank of California, Hamburg
EXTRACTS—Quebacho, 420 bags, International Products Corp., Buenos Aires.
GLUE BONES—1,654,198 lbs., Order, Buenos Aires; 1,543,234 lbs., Chase National Bank, Buenos Aires.
LINSEDD MEAL—12697 bags Order, Buenos
OIL—Citronella, 6 drums Atkins Kroll & Co. Colombia; **Cod Liver**, 50 bbls., Chas Cable Co., Yokohama; 60 bbls., Langley & Michaels. Hamburg; 100 packages, Wilbur Ellic Co., Kobe; **Rapeseed** 300 drums Pacific Vegetable Oil Co., Osaka; **Wood** 200 drs., Anglo & London-Paris National-Hongkong; 150 drums, Crocker First National Bank, Hongkong; 150 bbls., Bank of California, N. A., Hongkong.
POTASH—134 drums, Superfos Co., Hamburg.
TALLOW—Vegetable, 738 pckgs., Pacific Orient Co., Hankow
TANKAGE—6,791 bgs., H P Baker & Bro., Buenos Aires; 2,172 bgs., Order, Buenos Aires
TURPENTINE — 60 drums, Mailliard & Schmiedell, Acapulco
WAX—Bees, 46 sacks, Rafael G. Torres, Mazatlan; 7 bales, Echeguren & Co., Mazatlan

IMPORTS AT NEW ORLEANS
April 29th to May 6th

BENZINE—7,836 tons, N O Refining Co., Curacao
BAUXITE—2,323 tons, Republic Mining Co., Paramaribo; 2,510 tons, Republic Mining Co., Georgetown
COPRA—3,937 tons, Proctor & Gamble, Manilla
CREOSOTE—8,923 tons, Thos. Barrett, London; 85 drums, Order, Liverpool
FULLER'S EARTH—1,700 sacks, Order, London
FERRO—Manganese, 100 tons, Order, Liverpool
GUM—Chicle, 666 bales, Wm Wrigley Co., Port Barrios; 1,215 sacks, Miss. Warrior Service, Campeche
MOLASSES—1,600,000 gals., Dunbar Molasses Co., Havana; 1,260,000 gals., Order, Jucaro; 765,128 gals., Penick & Ford, Banes
POTASH—Caustic, 81 drums, Order, Scandinavia

IMPORTS AT WILMINGTON, N. C.
April 30 to May 6

SODIUM—Nitrate, 5,500 tons Order, Nordpol, Chile.

IMPORTS AT NORFOLK, VA.
April 7-21

ASPHALT—Liquid, 334 drs., Mauemont Corp., London.
BONE MEAL—1108 bags, Order, Rotterdam; 1096 bags. Order, Hamburg.
CHALK—200 cks., 25,000 kilos., Order, Antwerp.
CHICORY—71 bbls., 6336 kilos., Order Rotterdam.
LEUNA SALTPETER — 1814 bags, 181,400 kilos., Order, Hamburg.
ORE—Iron, 6600 tons, Order, Bongie Algeria.
PEAT MULL—19 bales, Atkins & Duborow, Bremen.
POTASH SALTS — Kainit, 1000 bags, 91,000 kos., Potash Importing Co., Hamburg; **Sulfate**, 2250 bags, 205,000 kos., Potash Importing Co., Hamburg.
QUEBRACHO EXTRACT — 781 bags, 780,552 lbs., Tannin Corp., Buenos Ayres.
SODIUM — Phosphate, 114 lbls., 18,696 kos., Alex. Co., Fergusson, Jr., Antwerp.

CHEMICALS IN THE WEST

Alcohol, ammonia, alkali, glycerin are discussed in "The Test Tube" published by Thompson, Hayward Co., St. Louis and Kansas City, saying:

Alcohol—Three months ago we advised the purchase of Alcohol to all who could arrange to carry it. Our advice is verified by recent spectacular advances. Last year we urged hand to mouth purchases on Alcohol. This suggestion was also in order. Our idea for this fall is to buy requirements early and at any level up to forty-five cents.

Ammonia—The low levels are reached and we expect a reaction shortly with firmer prices on those items in which Ammonia enters as a raw material.

Alkali—The competitive conditions which feature this section of the chemical market continues, especially with reference to Caustic Soda. The drive for tonnage records still continues however and if persisted it can only mean a buyers market.

In the Chemical field Blue Vitrol, Calcium Chloride, Epsom Salts, are a few of the items that hold danger for the buyer. If diplomatic relations between several of the manufacturers should be severed beware the deluge.

Glycerin has gone lower than we expected and we feel that present levels of around 26c will prove favorable by fall. Glycerin will settle down and secure a definite place as an anti-freeze in our opinion, that will serve to keep it on a more uniform basis.

Robert Magruder, associated with Morris Herrmann & Co., Inc., New York, for the past eighteen years, has resigned as secretary of that corporation.

BENZOL IN STORAGE

(Continued from page 701)

IN the opinion of the Committee, the prevention of resinification by the addition of substances to crude resinification, whilst at the same time avoiding removal of substances retarding resinification.

freshly distilled benzols is the more promising line of investigation, and experiments which have been in progress during the past year have shown that it is possible to retard or prevent the resinification of benzols during storage by the addition of small quantities of certain substances. These experiments are described and discussed in detail in the Report.

It is well known that light accelerates the resinification of benzols and other motor spirits containing unsaturateds, and the previous research indicated that an examination of this might assist in elucidating the various factors on which the resinification of benzols depends. Before carrying out experiments to determine whether the results given by the ultra-violet light test can be correlated with the quantities of resin obtained on evaporating benzols after storage for a definite period, two preliminary investigations were considered necessary. One was to determine whether the presence of water in varying quantities in unrefined benzols affected the results given by the ultra violet light test, and the other to determine whether benzene, toluene, and xylene, in the absence of all traces of impurities which might promote resinification, give weighable quantities of resin under the conditions of this test. It was concluded from the results of these investigations that water has little effect in promoting or retarding, under the action of ultra-violet light, the formation of resin from unsaturateds, the small effects observed apparently depending both on the nature of the benzol and on the conditions under which it was exposed (e. g., material of containing vessel). Pure benzene, toluene and xylne, saturated with water, were found to give very little resin when exposed to ultra-violet light for the comparatively short periods, which produced under the same conditions considerable resinification of the unsaturateds in unrefined benzols.

The results, of both storage and ultra-violet light experiments, show that the rates of resinification of the unsaturateds in unrefined benzols are largely dependent both on the presence of certain substances which have the power of promoting or retarding resinification and on the material of the containing vessel. Of the various traces of substances usually present in unrefined benzols, phenols appear to be of primary significance with regard to the resinification of the unsaturateds. The powerful inhibiting effects of phenols, and other substances in suitable concentrations on the resinification of benzols, suggests the possibility of preventing the resinification on storage of unrefined benzols, and similar motor fuels containing unsaturateds, and utilising them satisfactorily in internal combustion engines.

Inhibitors.

So far, a detailed examination of the effects produced by only one inhibitor (cresol) has been made. For this inhibitor,, it has been shown that for a given set of conditions there is an optimum concentration, which produces the maximum inhibiting effect, and that with concentrations greater or less resinification increases. This optimum concentration apparently varies with the time of storage, or exposure to ultra-violet light, the material of the containing vessel, and the particular benzol to which the inhibitor is added. Thus the concentrations of cresol necessary to prevent benzols resinifying on storage for five months in the dark in glass, are of the order of 1 part of cresol in 2,500 parts of benzol. For shorter periods of storage the quantity necessary may be appreciably less.

[*New Incorporations*]

NEW INCORPORATIONS—BOC

Bloomer Burkestone, Inc., Wilmington, Del.; $500,000; deal in clays, cements, rock, limestone and other ores; T. L. Croteau, A. L. Miller, Alfred Jervis.

Ducktown Pyrites Corp. of N. Y., Dover, Del.; 160,000 common, H. C. Hand, S. C. Wood, R. J. Gorman.

Dennison Chemical Corp., New York; $50,000; J. W. Dennison, W. H. Simmons, H. Frischkorn.

Arnold-Josue Inc., San Francisco, $25,000; rust dissolvers and belt dressings; Frank J. Arnold, G. J. Josue, Mary Rose.

Mid-Ocean Products Co., San Francisco, $1,500,000; ocean products; William A. Dolman, C. H. Fish, Jr., A. K. Eschenburg.

Dannenbaum Paint Co., San Francisco, Cal., $50,000; paints; D. K. Lerner, F. R. Rogers.

Champion Soap Co., Bronx, N. Y. 150 shares, common.

Vanhorne Co., Mahwah, N. J., Paterson, N. J. $125,000.

Sun-Ray Sales Co., South Orange, N. J., 10,000 shares, pf. 1,000 shares, common, polishes.

Preservo, Inc., New York; $30,000; liquid cleanser.

Premier Dyeing Co., Inc., West New York, N. Y.; $100,000.

Queen Silk Mfg., Co., Wilmington, Del., $200,000 wearing apparel.

Schaefer Works, Wilmington, Del., $100,000; steel, chemicals, fabrics.

Safe-T-First Chemical Corp., Wilmington, Del., $50,000.

American Teasel Co., Skaneateles, N. Y., 500 shares, common; agricultural products.

Sanico Chemical Corp., New York; 100 shares, common.

Leading Silk Mills, Paterson, N J., $30,000.

Consumers Photo Products Co., Wilmington, Del., 10,000 shares, common; cellulose products.

Jackson Mica Corp., Wilmington, Del., $100,000.

Guggenjeim Distilleries of Canada, Ltd., Windsor, Ont., Can.; 100,000 shares, no par; Harold J. Larsen, Maxwell H. Levenson, Harry Glick.

Onazote Corp. of Canada, Ltd., Toronto, Ont.. Can.. $2,000,000, and 30,000 shares, no par; manufacture rubber products; Arthur Brodey, Jacob H. Greenburg, John N. Niblock.

Bliss, Kershern & Cohn. Ltd., Winnipeg, Manitoba, $50,000; dyers and cleaners; Samuel Bliss, Shea Kerhern, David Cohen.

Canada French Cleaniterias. Ltd., Toronto, Ont., Canada; $40,000; dyers and cleaners, Wilford R. Scott, Fred J. Savage, Oscar H. King.

Art Loom Co., Ltd., St. Johns, Quebec; $150,000; manufacture textiles; Max I. Sigler, Moses H. Myerson, Robert G. Webber.

Guelph Felt Co., Ltd., Guelph, Ont., Can., $50,000; manufacture textiles; Leo W. Goetz, Angus Dunbar, Grace Roberts.

Seiberling Rubber Co. of Canada, Ltd., Toronto, Ont., Can.; 500 shares, no par; rubber products; Bruce V. McCrimmon, John G. Middleton, Edward P. Tilley.

Building Chemical Corp., New York, $20,000; waterproofing compound.

Synthetic Nitrogen Products Corp. of N. Y., Wilmington, Del., $500,000.

Bolinross Chemical Co., Newark, N. J., $100,000.

Fumigation Service, Wilmington, Del., 1,000 shares, common.

Eucalyptus Soap Co. of America, Reno, Nev.; 100,000 shares, no par; W. S. Harris, J. Penque, F. H. Welling.

Visa Co., New York; 200 shares, common; olive oil.

Venus Anti-Freezing Chemical Corp., New York; $5,000.

Marvel Laboratories, New York; $5,000.

Robert Rosenthal Corp. of N. Y., Dover, Del.; $600,000; textiles.

Varied Color Dyeing Co., New York; $10,000.

CAPITAL INCREASES

Pittsburg Cleanser Laboratory, Inc., Pittsburgh; $50,000 to $100,000.

Copper Pyrites Corp., New York; 20,300 to 23,300 shares of which 20,000 are $10. each; 3,300 common, no par.

CAPITAL REDUCTION

Washington Heights Ice Corp., New York; 8,500 shares to 6,500 shares of which 1,500 are $100 each, 5,000 common, no par.

No-Par Stock, by Carl B. Robbins, M.A., Instructor in Economics, Stanford University. Cloth bound, 288 pages. Published by The Ronald Press, New York.

A study of the aspects of the new device of corporations now authorized in thirty-eight States of the Union. The book is divided into two parts, taking up first the legal, financial and economic problems, and in the second part, the accounting problems.

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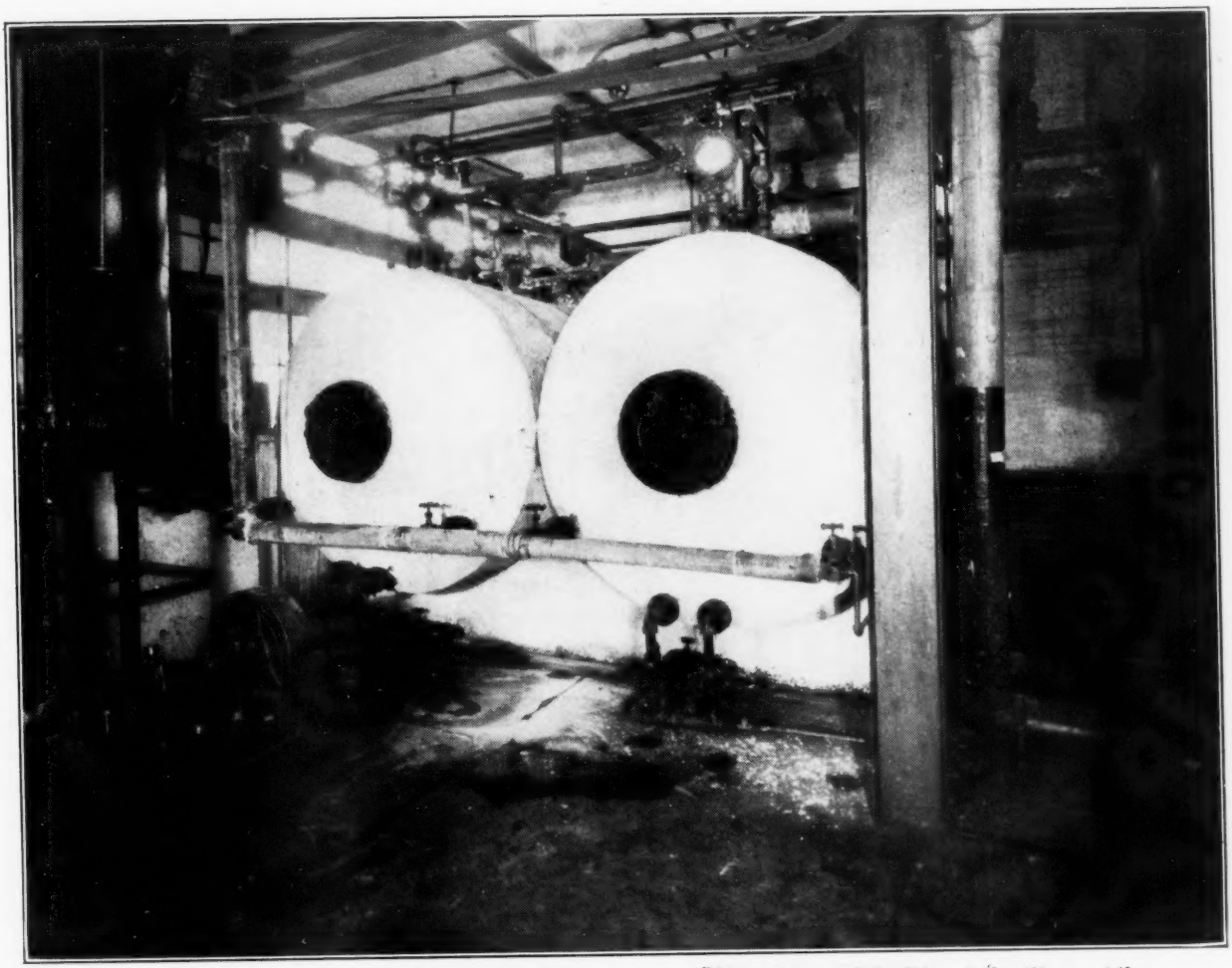

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Patents

Latest Issues Covering Chemical Products and Processes.

TO SECURE COPIES OF PATENTS

U. S., 10c U. S. Patent Office, Washington. British, draft on London, one shilling, British Patent Office, 25 Southampton Bldgs., Chancery Lane, W. C. 2, London. French one franc, Minister of Commerce & Industry, Paris. German, draft on Berlin, one mark, German Patent Office, Berlin.
Application date appears with each patent.

UNITED STATES PATENTS
Issued April 26, 1927.

1,625,807.—Ammonium Nitrate Process. H. Howard, assignor, The Grasselli Chemical Co., Cleveland. May 26, 1926.

1,625,815. — Paint Composition. J. W. Lowman, Chattanooga, Tenn. May 22, 1925.

1,625,82 .—Vat Dyestuffs. M. P. Schmidt, Biebrich-on-Rhine, assignor, Grasselli Dyestuff Corp., New York. Nov. 20, 1923.

1,625,831.—Absorbing, Leaching and Filtering Cases and the Like, process and apparatus. H. M. Stark, Highland Park, Mich. Feb. 24 1923.

1,625,852.—Linoxinlike Substances, process. W. O. Herrmann, and H. Deutsch, assignor, Consortium fuer Elektrochemische Industrie, Munich. June 13, 1925.

1,625,919.—Centrifugal Separator. T. C. Thomsen, Copenhagen, assignor, Messrs. Koefed, Hauberg, Marstrand & Helweg Aktieselskabet Titan. July 9, 1926

1,625,924-9. — Catalyst for Synthetic Methanol. J. C. Woodruff and G. Bloomfield, assignors, Commercial Solvents Corp., Terre Haute, Ind. May 26, 1926, June 21, 1926.

1,625,966.—Detonating Compound for Explosive and Percussion Caps. E. von Herz, Berlin-Charlottenburg, Oct. 21, 1925.

1,625,9 9.—Lubricant. H. H. Willock, S. J. Caplan, and J. E. Babb, assignors, Waverly Oil Works Co., Pittsburgh. Aug. 30, 1925.

1,625,984.—Distilling Hydrocarbons. E. M. Clark, New York, assignor, Standard Development Co. Jan. 17, 1921.

1,626,055. — V. L. Tannehill, assignor, Fort Wayne Engineering and Mfg., Co., Fort Wayne, Ind. Aug. 9, 1926.

1,626,056.—Storage System and Method of Storing and Removing from Storage a Liquid. M. B. Anfenger, assignor, Standard Oil Co. of California, San Francisco. May 13, 1925.

1,626,167-9.—Dyestuffs Containing Chromium. F. Straub, assignor, Society of Chemical Industry of Basle, Basle, Switzerland. Jan. 29, 1926.

1,626,208. — Binding Fuel Material and Method. T. Nagel, Broklyn. May 24, 1924.

1,626,223.—Distilling Apparatus. J. H. Burlingham, Port Arthur, Tex., assignor, The Texas Co., New York. Oct. 18, 1921.

1,626,260.-1—Making Refractories. P. G. Willetts, West Hartford, Conn., assignor, Hartford-Empire Co., Hartford, Conn. Sept. 23, 1926 and Oct. 13, 1926.

1,626,292.—Making Fluxing Materials, process and apparatus. J. Lund, San Francisco. Oct. 23, 1920.

1,626,345.—Separating Gaseous Mixtures, apparatus. J. Le Rouge, Boulogne, assignor, Societe L'Air Liquide, Paris. Feb. 1, 1923.

1,626,346.—Distilling Apparatus. W. K. Lewis, Newton, Mass. assignor, Standard Development Co. Dec. 5, 1923.

1,626,360.—Spray Cooling Machine. B. R. Sausen and H. D. Binks, assignors, Binks Spray Equipment Co., Chicago. Sept. 19, 1921.

1,626,362.—Oxidized Pine Oil for Pigments. J. K. Speicher, Kenvil, N. J., assignor, Hercules Powder Co., Wilmington. July 20, 1926.

1,626,392.—Benzathorne Process. R. G. Caswell and E. G. Marshall, Wilmington, assignor, E. I. du Pont de Nemours & Co. Nov. 22, 1919.

1,626,418.—Making Amorphous Carbon. J. W. MacDonald, Litle Rock, Ark., assignor, W. L. Rucker, Los Angeles. Dec. 14, 1925.

1,626,487.—Emulsifier. D. Warren, Lewiston, Me. Jan. 10, 1924.

1,626,499. — Bottle Closure. C. Benetti, Barcelona, Spain. May 5, 1925.

1,626,577.—Artificial Stone or Marble, L. E. Welch, Memphis. Aug. 17, 1926.

1,626,579.—Culture Mixture for Fertilizer. C. A. B. Crusius, Dresden. Feb. 12, 1926.

1,626,588.—Distillation Tar. W. B. Davidson, A. C. Michie and E. W. Muddiman, Newcastle-on-Tyne, England. Apr. 23, 1926.

BRITISH PATENTS
Issued March 30, 1927.

265,190. — Litharge. J. J. Tardan, Cibourne, France. Jan. 21, 1927.

265,193.—Phthaloyl-2:3—Thionaphthenes. I. G. Farbenindustrie A. G., Frankfurt, Germany. Jan. 25, 1927.

265,197. — Alkali Dicalcium Phosphate. Rhenania-Kunheim Verein Chemischer Fabriken A. G., Berlin and H. Brenek, Porz, Germany. Jan. 25, 1927.

265,203.—Azo Dyes. Geigy A. G., Basle, Switzerland. Jan. 26, 1927.

265,206. — Impregnating Wood. J. R. Coolidge, Brookline, Mass., assignor Montan. Inc., Boston. Jan. 26, 1927.

265,207.—Detecting Carbon Monoxide. G. G. Chaudron, Seine, France, assignor, E. Espes, Paris. Jan. 26, 1927.

265,212.—Extracting Vegetable Oils. J. Behrens, Bremen, assignor, I. G. Farben Industrie A. G., Frankfurt, Jan. 27, 1927.

265, 224.—Isatan Derivatives. I. G. Farbenindustrie A. G. Jan. 28, 1927.

265,232.—Naphthalene Dyes. I. G. Farbenindustrie A. G. Jan. 29, 1927.

265,233.—Esters. I. G. Farbenindustrie A. G. Jan. 31, 1927.

265,252.—Treating Solids and Liquids. Apparatus. C. F. Hammond and W. Shackelton, Westminister. Sept. 5, 1925.

265,259.—Ethylene Chlorohydrin. C. L. Long, F. Willson, and T. S. Wheeler, London. Oct. 2, 1925.

265,305. — Alkali Cyanides. S. Coulier Brexelles, Belgium. Nov. 7, 1925.

265,305. — Lactic and Lactates. S. E. Faithfull, West Orange, N. J. Dec. 8, 1925.

265,375. — Distilling Tar, etc. Braunkohlen Produkte A. G., Berlin and K. Bube, Halle and E. Erlenbach, Berlin. Feb. 3, 1926.

265,378.—Match Striking Compositions. H. W. Robinson, West Bromwich, Feb. 4, 1926.

265,417.—Bleaching Baths. T. Benckiser, A. Reimann and O. Reimann, and F. Draisbach Ludwigshafen. Apr. 7, 1926.

265,449.—Drying Bricks. M. M. Minter, Columbus, Ga. June 18, 1926.

265,484.—Asphalt. J. H. Vinden, London. Sept. 15, 1926.

265,491. — Benzyl Cellulose. I. G. Farbenindustrie A. G. Oct. 1, 1926.

265,494.—Aluminous Cements. G. Hertzka, Budapest, Oct. 5, 1926.

265,498.—Thiazthionium Compounds. L. Cassella & Co., Ges., Frankfurst. Aug. 7, 1925.

265,517.—Separate Heater and Evaporator. W. Vogelbusch, Ratingen, Germany. Nov. 1, 1926.

265,541.—Pigament Oil Pastes. G. W. Acheson, Caldwell, N. J. July 23, 1926.

265,545.—Benzoyl Orthobenzoic Acid Derivatives. R. Adams and J. M. Davidson, Urbana, Ill., and I. Gubelmann, South Milwaukee, Wis., assignors, Newport Co., Carrollville, Wis. Oct. 20, 1926.

265,550.—Lithopone. F. G. Breyer, Palmerton and C. W. Farber, Bowmanstown, Pa., assignors, N. J. Zinc Co., New York. Dec. 9, 1926.

265,553.—Tetrakisazo Dyes. J. B. Oesch, Milwaukee, assignor, Newport Co., Carrollville, Wis. Dec. 20, 1926.

GERMAN PATENTS
Issued April 7, 1927.

440,999.—Atomizing Drying of Liquids. Rotopulsor A. G., Schaffhausen and Dr. C. Boehm v. Boernegg, Frankfurt. Mar. 25, 1924.

440,976.—Gasoline-Water Separator. O. Fick, Hamburg. Jan. 21, 1926.

CHEMICAL MARKETS—BOC

440,977.—Continuous Automatic Separation of Two Non-Miscible Liquids. Dr. Hurdelbrink, Koenigsberg. Dec. 14, 1923.

441,000.—Remove Dust from Gases. J. G. Schulz and H. J. M. Loriot, Paris. Mar. 27, 1924.

441,001.—Homogeneizing Machine. Bergdorfer Eisenwerk A. G., Bergedorf b. Hamburg. Jan. 6, 1925.

441,054. — Phosphorous Pentoxide in coarsest possible form. Deutsche Gasgluehlict Auer G. m. b. H., Berlin. June 9, 1925.

440.873. — Electrical Carbon Disulphide Furnace. Studien-Ges. fuer Wirtschaft & Inlustrie m.b.H., Munich. June 7, 1925.

440,918. — Ammonium Chloride from Ammonia Soda Mother Liquors. I. G. Farbenindustrie A. G., Frankfurt. May 12, 1923.

440,978.—Lead Suboxide. L. Guterschn, Berlin. Dec. 11, 1923.

441,002.—Succinic Acid Anhydride. I. G. Farbenindustrie A. G. Dec. 18, 1924.

441.003. — Oxybutyeric Ocid. Dr. A. Wacker Ges. fuer Elektrochemische Industrie G. m. b. H., Muenchen. May 28, 1925.

440,890. — 1—Anthraquinone Derivatives. I. G. Farbenindustrie A. G. Dec. 28, 1924 and Jan. 23, 1925.

FRENCH PATENTS

622,637.—Hydrogenation of Phenolic Products, etc. C. Laillet and J. Giustiani. Feb. 1 1926.

622,660. — Extraction of Iodine from Marine Algae, etc. C. Sicot and P. Davion. Feb. 4, 192 .

622,684.—Potassium Sulphate and Ammonium Chloride. N. Sevrin. Feb. 8, 1926

622,680. — Concentrating Acetic Acid. Societe Anonyme Brogil. Feb. 6, 1926.

622.734. — Chromium Compounds. The Mathieson Alkali Works. Aug. 3, 1926.

31,911. Addition to 605,226. — Pyridine Substitution Products. Deutsche Gold und Silber Scheile Anstalt vorf. Roessler. May 18, 1926.

622,649.—Decolorizing Solutions with activated Charcoal. Urbain Corp. Feb. 2, 1926.

622.759. — Dialcoxylated Derivatives of Benzhydrylamine. Etablissements Poulenc Freres. Feb. 4, 1926.

622,851.—Treating Cellulose Derivatives. H. Dreyfus. Oct. 8, 1926.

622,852.—Treating Cellulose. C. Dreyfus. Oct. 5, 1926.

622,974.—Azo Colors. I. G. Farbenindustrie A. G. Oct. 12, 1926.

623,015 — Activated Charcoal. Urbain Corp. Feb. 16, 1926.

622.693. — Sulphoni Acids of Petroleum Hydrocarbons. P. Schestakoff. Feb. 9, 1926.

622,715. — Cracking Process. P .Wurth. Oct. 9. 1925.

622,951.—Soap Product. A. G. Charlton and T. B. Rowe & Co., Ltd., Oct. 12, 1926.

622.963 — Non-Drying Oil Products, M. T. Harhey. Oct. 12, 1926.

622,733.—Decolorizing Turpentine. Societe d'Etudes et d'Applications pour le Progres de L'Industrie Resiniere. Oct. 2, 1926.

622,896.—Marine Rubber. C. A. Houques-Fourcade. Oct. 9, 1926.

622,975.—Vulcanization Process and Apparatus. Societa Italiana Pirelli. Oct.

622,926. — Filter with Interchangeable Elements. K. & T. Moller, G. m. b. H., Oct. 11, 1926.

31,895 Addition to 606.408. — Sterilizing Water by Electryolysis. P.M. R. Salles. Aug. 29, 1926.

Exports *Chemicals, Oils ana Fats*

EXPORTS AT NEW YORK

ACETONE—48 drs., April 9, Gothenburg; 16 drs., April 9, Stockholm

ACIDS—Cresylic, 20 drs., April 1, Callao; **Muriatic,** 7 carboys, April 6, Kingston; **Stearic,** 5 bgs., April 16, Vancouver; **Sulphic,** 50 drs., April 13, Talara; 50 drs., April 1, Talara; **Tartaric,** 4 kegs, April 12, Pto Colombo

AMMONIUM ANHYDROUS—7 cyl., April 13, Callao; 7 cyl., April 22, Port Au Prince; 12 cyl., April 8 Rio de Janeiro; 60 cyl., April 8, Santos

AQUA AMMONIA—15 cs., April 15, Vancouver

ASPHALT—150 brls., April 11, Bristol; 25 bgs., April 1, St. Johns; 224 brls., April 5, Adelaide; 21 cts., April 5, Brisbane

BUTYL ALDEHYDE—1 drum, April 8, Bordeaux

CALCIUM—Carbide, 246 drs., April 13, Coquimbo; 100 drs., April 13, Talcahuano; 588 drs., April 21, Pastelllllo; 200 drs., April 13, Manati; **Chloride,** 14 drs., April 13, Tocopilla

CARBIDE—6 drs., April 15, Sto Domingo

CARBON—Bisulfide, 6 drs., April 13, Pt Tarafa; **Black,** 90 cs., April 22, Bergen; 20 cs., April 7, London; 25 cs., April 20, Havre

COPPER—Sulfate, 200 cks., April 12, Gravosa

CORN FLOUR—100 cs., April 15, Monte Cristi; 20 cs., April 15, Pto, Plata

CORNSTARCH—300 cs., April 15, Santos; 3,000 cs., 1,200 bgs., April 15, Alexandria; 215 cs., March 25, Port Natal; 370 cs., March 25, Algoa Bay; 225 cs., 10 brls., March 25, Capetown; 220 cs., March 25, Delagoa Bay; 25 cs., April 9, Santo Domingo; 20 cs., April 15, Monte Cristi; 300 bgs., April 4, Piraeus

CORN SYRUP—40 kegs, April 12, Pto Colombia; 300 brls., April 15 Alexandria; 10 brls., March 25, Delagoa Bay; 10 brls., March 25, East London; 60 brls., March 25, Salonica

DINITROCHLORBENZENE—18 drs., April 15, Santos

DYESTUFFS—20 pgs., April 9, Antwerp; 33 cs., April 1, St Johns; 10 cs., April 8, Porto Alegre

EXTRACTS—Tanners. 64 brls., April 11, Bristol; 20 brls., April 5, Manchester

FERTILIZER—850 bgs., April 21, Pto Tarafa; 38 bgs., April 8, Porto Alegre; 16,012 bgs., bgs., April 13, Pto Tarafa

GLUCOSE—50 brls., April 15, Alexandria; 60 brls., March 25, East London; 60 brls., April 12, Trieste; 60 brls., April 16, Trieste; 30 brls., April 7, London

GLYCO GLYCERINE—8 drs., April 12, Cartagena

LIME ACETATE—25,450 bgs., April 23, Liverpool; **Hydrated,** 15 brls., April 21, Pastelillo

LINSEED OILCAKE—3,382 bgs., April 9, Antwerp; 10,392 bgs., April 9, Antwerp; 6,834 bgs., April 19, Antwerp; 4,325 bgs., April 15, Rotterdam; 1,980 bgs., April 17, Liverpool

NITROUS OXIDE—6 pgs., April 1, St Johns

OILS—3 cs., April 13, Callao; 2 cs., April 13, Valparaiso; **Castor,** 20 cs., April 13, Mollendo; **Copra,** 50 drs., April 13, Nuevitas; **Linseed,** 5 brls., April 1, St Johns; 65 drs., April 13, Pto Tarafa

POTASSIUM SALTS—Chloride, 4 kegs, April 12, Guayaquol; **Xanthate,** 11 drs., April 9, Gothenburg

SODIUM SALTS—Ash, 320 drs., April 15, Rotterdam; 5 kegs, April 7, London; **Bichromate,** 32 cks., April 9, Norrokoeping; 5 brls., April 22, Montevideo; **Caustic,** 1,000 cs., April 8, Santiago; 280 drs., April 16, Buenaventura; 47 drs., April 1, Callao; 20 drs., April 13, Pisco; 80 drs., April 13, Valparaiso; 10 drs., April 22, Port Au Prince; 5 drs., April 12, Pto Colombia; **Cyanide,** 250 drs., April 1, Salaverry; **Nitrate,** 116 bgs., April 1, Port Antonio; **Sal,** 400 bxs., April 16, Vancouver; 50 brls., April 12, Kingston; **Silicate,** 2 drs., April 5, Manchester; **Sulfite,** 1 brl., April 16, Vancouver

SULPHUR—72 bgs., April 1, St Johns

TITANIUM—Tetrachloride, 30 drs., April 23, Liverpool

WAX—407 sks., April 1, Hull; 87 brls., April 8, Genoa

ZINC OXIDE—240 brls., April 11, Bristol; 34 brls., March 24, St Johns; 10 brls., April 17, Liverpool

TILE FROM SLUDGE

Waste sludge from the Calumet Chemical Co.'s plant at Joliet, Ill. is being converted into a gypsum tile through processes perfected under direction of U. C. Young, general superintendent and by-products of the chemical plant, which specializes in production of phosphoric acid, are turned into revenue. The sludge after soluble phosphates have been decanted, is pumped into wooden vats where neutralizing agents are added as agitators keep the vats in motion. The temperature is maintained at 140 degrees and during this treatment alkalis or sludge are added as tests indicate are required. The mixture is treated for removal of acidity by filtration and then cleaned.

Forty-ton storage bins receive this plaster which is sent to mixing rooms where stucco and wood fibre are mixed with the compound by accelerators. From this the plaster goes to 105-foot kilns, coke heated.

Polish Alcohol Monopoly will introduce a new system of selling denatured alcohol based on special permits for those who can prove that they are using it in quantities not exceeding 50 liters per person per year for heating or lighting purposes. This does not apply to industrial establishments using denatured alcohol for technical ends, to whom permits for larger amounts will be issued by the Monopoly. The new permit system will not apply in the cities of Warsaw, Lodz, Lwow, Cracow, Poznan, Bydgoszcz, Lublin

Dye bark used in the Philippines is obtained from nigi or tabigi (Xylocarpus granatum). This is a large tree with a thin smooth bark. In 1925, 83,614 kilos were produced. It is used for tanning and dyeing fish nets, clothes and ropes. It dyes cotton goods reddish brown. A chemical analysis shows moisture 14.2 per cent, insoluble 87.6, total extract 32.4, nontannin 7.7, tannin 24.7.

MOROCCO'S CHEMICAL NEEDS

Imports of industrial chemicals into Morocco are relatively small. Calcium carbide is the most important chemical commodity imported. Alum is employed by the native dyers for treating silk and wool. Sulfur is used for agricultural purposes. Caustic soda is largely employed by the painting trade and by the natives for the manufacture of soap. About 200 tons of sodium carbonate annually are imported from the well-known Solvay works of France and Belgium. Importations of copper sulfate are increasing.

GERMAN TANNING PATENT

Recent patents taken out by I. G. Farbenindustrie A. G. are expected to produce a tanning material not only effective as such but capable of improving the efficiency of other tanning materials. This development may lessen imports into Germany of tanning materials from abroad. According to this patent, says "Deutscher Forstwirt", Berlin, finely divided wood charcoal with 14.8 per cent oxygen content is stirred in water, treated with 95 per cent nitric acid and twelve hours cooking, the greater part of the liquid is distilled off, 95 per cent nitric acid is slowly added again, and this is heated for two days to weak boiling when almost all the hydrous HNO_3 is distilled off, finally in a vacuum. After repeated evaporation to a dry state the residue is powdered. This is an orange to yellowish product that is completely soluble in water.

PURIFYING CLAYS

Alum is being used to purify clays. Certain electrolytes, particularly alkalies, added to a suspension of colloidal particles cause deflocculation so that suspension may be maintained indefinitely. The addition of other electrolytes, particularly acids, on the contrary produces flocculation and the particles are rapidly precipitated from suspension leaving a clear liquid above the precipitated mass. Salts of trivalent element such as aluminum acts similarly. Due to its cheapness the double sulfate of aluminum and potassium, ordinary alum, has been used extensively for treating clays. These properties of electrolytes and their utilization in the commercial preparation of clays have been described in publications of the Bureau of Mines, Washington, by W. M. Myers.

COAL TAR SOLVENTS

(Continued from page 700)

really satisfactory substitute for the benzol-rubber cements has been discovered.

In imitation leather the use of benzol is identical with its use in lacquers, but here, since operation involving the evaporation of the benzol is entirely within the manufacturing plant, there is the opportunity of minimizing the hazard by proper ventilation and medical supervision. There is, therefore, less tendency to go to the expensive solvents in this industry, although a thoroughly satisfactory substitute for benzol or toluol would be extremely welcome.

The chemical industry will absorb increasing amounts of benzol and toluol, but in the case of the former material can hardly be expected to absorb more than a very small fraction of the available supply.

The tendency in the production of coal tar solvents may therefore be summed up by the statement that the producers have a definite and strong incentive to produce the maximum amount of pure toluol possible which carries with it as its corrollary the disposal of substantially pure benzol in the motor fuel field. It, further, means that at the same time the maximum amount of xylol and heavier solvents will be obtained.

From the side of the user there will be constant effort to do away with the use of benzol in all fields except those of the chemical industry where pure benzol is used as a raw material for the manufacture of intermediates, dyes, medicinals and the like. It will always be absorbed in the motor fuel field at a price. In most of the cases other than chemical, toluol is a satisfactory substitute, but there is not sufficient toluol available to supply the entire demand for such a substitute.

The indications are therefore for a very weak benzol market with ample supplies available and the price tending to approach the current level of tank wagon gasoline prices. Toluol will be in strong demand with the supplies short and inadequate so that it will command a market price two or three times that of benzol. The increased production of xylols and heavier solvents incident to the separation of larger amounts of toluol will in all probability cause a moderately weak market for these products for some time to come, although eventually, since the amounts available are limited, the demand should overtake the supply and stabilize the market.

The writer in his attempt to forecast the future market situation of the coal tar solvents realizes fully that prophesy in such matters for any extended period in the future is unsafe. There is always the very distinct possibility of further advances in our scientific knowledge and in the applications of this knowledge to industrial development, bringing about such changed conditions that the entire commercial picture of products and industries is changed, and with them the market situation likewise changes. We can only interpret the tendencies of the present and translate them into future probabilities with considerable reservation as we are in an age of scientific and industrial achievement where the curiosity of the scientific laboratory becomes a tonnage article of commerce with unbelievable rapidity.

SOLVENTS CONTAINING CHLORINE

(Continued from page 708)

obviously not to write a scientific treatise, but to point out that solvents, of what may be called the chlorine group, are important and useful and that selection should not rest, as it does, on cost per pound or gallon, but strictly on properties and technical values.

BUTANOL

(Continued from page 703)

Butanol, like fusel oil, is a fermentation product. Corn is the usual raw material from which both are made. The value of corn is therefore the greatest single factor in determining the cost of butanol. With a stable manufacturing cost but a fluctuating corn cost, the obviously fair method of selling was to give the consumer any advantage that favorable corn prices might entail. Buyers of corn products are accustomed to this method, and paint and lacquer manufacturers have always bought their linseed oil, coal tar thinners and in fact most of their raw materials in fluctuating markets. Any basic raw material is bound to vary more or less in price, but such fluctuations tend to diminish as we get nearer the ultimate consumer of the finished product. If the manufacturers of butanol sold it at

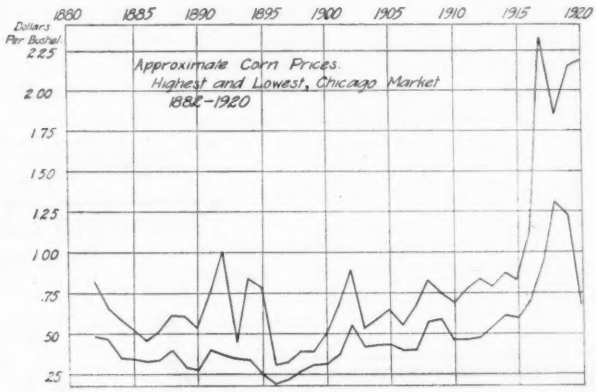

Plate 5

a fixed price this price would have to be predicted on a corn cost somewhat higher than the actual average. The consumer would pay more for his butanol in the long run.

Plate No. 3 shows butanol prices from 1920 to date. It will be noted that the custom of basing the butanol price on the corn price was not inaugurated until the close of 1924, since which time both price curves (Plates 3 and 4) have been practically parallel except for a natural lag of about a month.

Any workable method of this nature necessitates the selection of some definite public market and some fixed grade of corn, the price of which, on that market, could always be readily ascertained. Plate No. 4 shows average monthly prices of contract grade spot corn on the Chicago Board of Trade during the past seven years. Although the price of a definite grade is the basis for determining monthly maximum butanol prices over contract periods, the manufacturers have generally been able to make their actual purchases in other markets and at somewhat lower prices than the Chicago base price. The fine upper line (plate No. 3) shows what the butanol price would have been if the manufacturer had been obliged to buy No. 2 cash corn on the Chicago Board of Trade. The heavier line for this same period shows the price at which butanol was actually billed, and indicates the extent to which butanol purchasers benefited by the savings made through the use of corn bought in more favorable markets.

The future price trend of lacquer materials is a subject of vital interest to lacquer manufacturers. As butanol depends largely on corn, plate No. 5 has been drawn up to show maximum and minimum corn prices over an extended period. This curve, together with the more detailed curve shown on plate No. 4 carries us back about forty-five years. The record presented is worthy of study. Utilization of hitherto wasted by-products may favorably affect the future

price trend of butanol but even without this factor there is no indication of any substantial increase in price.

Plate No. 1 clearly shows the remarkable increase in lacquer production which has taken place since 1923. While the development of low-viscosity cotton no doubt greatly influenced this sudden growth, there is reason to believe that an adequate supply of butanol played an almost equally important part. During the period of process difficulty in 1922 and 1923 it was impossible to supply more than a small part of the butanol required by lacquer producers. But with the elimination of these difficulties, by the Spring of 1924, greatly increased quantities of butanol became available and lacquer production was at last in a position to forge ahead without any internal limitation to its progress. Capacity of plants has been frequently increased and since 1923, has always managed to keep safely ahead of demand.

Attempts have been made to explain the predominant position and sustained popularity of butanol in the lacquer industry. Exhastive work has been done on the laboratory evaluation of lacquer solvents. Much of this effort has been useful but no method of test has yet been discovered which can be safely used in justification of any radical change. Lacquer ranks as one of the most expensive protective finishes. It is used on high priced automobiles, furniture, buildings, and other surfaces where its superior durability has outweighed its higher cost. The saving that might be effected by reducing or changing this, that, or the other ingredient is insignificantly small compared to the loss that might result through premature failure of the film. Modern lacquer is a highly complex mixture; it may be stored under varying conditions for varying periods. It may be applied under unfavorable conditions by men unfamiliar with its use. Those manufacturers of lacquer whose experience is the longest and whose output is the largest have long since learned that butanol is a solid foundation on which to build.

Many new products, developed at great cost for this important new market have appeared during the past few years. Each of these compounds has its special advantages as compared with butanol but none of them happens to be produced by a fermentation process. It may be that the effect of this fundamental difference in origin will some day be fully explained. It is a fact that fermentation solvents behave particularly well in a lacquer formula, but no research effort has yet been able to give the full reason. Experience has shown what butanol will do. Chemistry may eventually tell us why.

LACQUER SOLVENTS FROM PETROLEUM

(Continued from page 705)

Secondary Hexyl Alcohol

It is understood that the yields of this alcohol from most cracked products are very good for hexyl alcohol. It has a boiling point lying somewhere between 135 and 145 deg. C and no apparent constant boiling mixture. It is insoluble in water and should find a real use in the solvent industries. The probabilities are that it would not be particularly good as a solvent for nitro cellulose but would be an excellent gum for those gums soluble in a hydrocarbon.

Secondary Hexyl Acetate

This ester also should be of extreme interest in the lacquer field. It has a boiling point of 140 to 160 deg. C and though it has a peppery odor there is no choke.

Tertiary Butyl Alcohol

Though this product could be made in fairly large quantities it has a very low boiling point, 83 deg. C and a constant boiling mixture which boils at 81 deg. C and therefore would not be of real interest in the lacquer field. It is also very doubtful as to whether or not its solvent power

for nitro cellulose would be high. It has an odor resembling turpentine.

Tertiary Amyl Alcohol

The boiling point of this product is 102 deg. C and its melting point is -12 deg. C. It is fairly soluble in water and has the same turpentine-like odor as the butyl compound. It is very doubtful if this alcohol will be of any great value in the present lacquer industry.

It should be noted also that the acetate acid esters of these tertiary alcohols are extremely difficult to make and the yields are low. This would tend to eliminate both the alcohols and the esters as lacquer solvents.

"Normal" Amyl Alcohol

One concern in this country seems to have successfully developed a process for the manufacture of a product which is claimed to be largely normal amyl alcohol. It is made from pentane using a modification of the standard chlorination and hydrolysis process. It has a boiling point around 135 deg. C and the product resembles fairly closely the old time refined fusel oil. There is no reason why this product should not be proved of immediate value in the lacquer industry due to the fact that it is only slightly different from the products now used.

The corresponding acetate boiling around 145 deg. C should be of extreme importance to the lacquer industry because it not only should replace satisfactorily a part of the medium boiling solvent butyl acetate but also replace satisfactorily the high boiling solvent, for example butyl propinate.

From the writer's standpoint this synthetic "normal" amyl alcohol and acetate should have the best immediate future of any of the solvents mentioned above. It is quite possible, however, in the course of lacquer development that other alcohols and esters will be of great value.

SECONDARY ALCOHOL

(Continued from page 704)

The odor of the secondary esters while different from that of the normal products is very pleasing and is free from the choking odor the normal acetate possesses. It is also interesting to note that Munch and Schwartz[3] find that the toxicity of secondary butyl alcohol is considerably less than that of normal butyl alcohol, which fact should make lacquers prepared from secondary products extremely attractive to the consumer.

Both isopropyl and secondary butyl acetates are being used in increasing proportions for all types of lacquers and they are of special value in brushing lacquers. The common practice in manufacturing this type of lacquer has been to use solvents of low vapor pressure which tend to produce such slow drying compositions that one of the highly prized properties of lacquers is lost. A considerable improvement is also noted when the nitrocellulose content is decreased and the proportion of resin is increased. In this way the more desirable medium boiling solvents may be used exclusively with the accompaniment of good brushing but quick hardening qualities. In a vehicle where secondary butyl acetate is the active solvent, the ideal composition for uniform drying and avoidance of "printing" difficulties is obtained.

The following formula in which a new synthetic resin, developed by Carleton Ellis and T. F. Bradly, is used, has been tested during the past winter by exterior exposure in Florida, and its durability has surpassed all expectations.

3. Journal of Lab. and Clinical Medicine, Sept. 1925.

Parts by Weight	7-Secondary Butyl Acetate
4-Synthetic Preservative Resin	2-Secondary Butyl Alcohol
1-½ sec. R.S. Nitrocellulose	6-Toluol
1-Dibutyl Phthalate	4-Pigment

Another type of brushing lacquer which has the following composition

Part by Weight		10½ R. S. Nitrocellulose
40 Sec. Butyl Acetate	5	Ester Gum
40 Sec. Butyl Alcohol	2	Dibutyl Phthalate
20 L. D. Naphatha		

has given very good practical results, and is much preferred for interior use, as it is relatively odorless. In connection with brushing lacquers it should be noted that the lifting action of secondary acetates is much less than that of the normal products.

In conclusion it can well be stated that the production of secondary alcohols will be a distinct contribution to the further growth of the lacquer industry. Their economic position is such that they should have a tendency to stabilize the solvent market. In view of the violent fluctuations that materials from other sources have experienced in the past few years, the prospect of having a constant supply of stable priced solvents from which to draw will enable the lacquer manufacturer to widen his ever growing field of activity.

ANSWERS TO "WHAT DO YOU KNOW?"

1. Alcohol. Plants representing 35 per cent of the total production of the country are located in and South of New Orleans as well as large stores of molasses.

2. Commercial Solvents Corp.

3. Ethylene glycol manufactured from ethylene by chlorination and saponification at the South Charleston plant of Carbide & Carbon Chemical Corp.

4. Sodium nitrate.

5. American Celanese Corp., manufacturers of artifical silk by the acetate process.

6. South Charleston, W. Va., a center of many basic raw materials such as coal and natural gasoline. Carbide & Chemical Corp. manufacture ethylene glycol and other products from ethylene recovered from natural gasoline, Sharples Solvents Corp., manufacture synthetic amyl alcohol from pentane from the same source, and Du Pont manufactured ammonia and methanol from coal.

7. Potash, the French and German makers of which have a practical monopoly and agree on the selling prices.

8. Francis P. Garvan, president of the Chemical Foundation, and George D. Rosengarten, of Powers-Weightman-Rosengarten Co., president of the American Chemical Society.

9. Growing crops, such as sugar and corn; coal; and petroleum.

10. Sharples Solvents Corp.; John D. Lewis Co.; Kessler Chemical Co.; David Berg Industrial Alcohol Co.

11. Corn in United States, coal in Germany; molasses and corn; petroleum; pentane from natural gasoline; carbon bisulfide and chlorine.

12. Foreign exhibitors are being admitted.

13. Control of U. S. Industrial Alcohol Co. has passed into the Hands of Percy Rockefeller of the Standard Oil Co.

[*Catalogs & Bulletins*]

Chemical Stoneware. Illustrated bulletin giving good description and applications of acid-proof kettles, tanks, pipings, plumbing fixtures, pumps, building materials, and a variety of industrial equipment. 22 pp. Maurice A. Knight.

"Chemistry Carries Industry Another Step Forward." Six page illustrated bulletin citing a number of manufactured products which have been improved by the use of Bakelite. Bakelite Corp.

Cochrane Bulletin. A quarterly publication, illustrated, devoted to the heating, deaerating, softening, filtering, and metering of water, the measuring of steam and related problems. 36 pp. Cochrane Corporation.

Fans and Blowers. Gives good detailed description and illustrations of "Sirocco" fans and blowers for various commercial purposes. Gives complete operating data for a big variety of conditions. 80 pp. American Blower Co.

"Floors without Flaws." Four-page bulletin describing 17 different preparations for protecting and preserving floors. A. C. Horn Co.

Flow Meters. Illustrated. Gives interesting descriptions and useful operating data on steam, water, and gas meters; liquid level recorders and indicators, pyrometers, draft instruments, CO_2 recorders, and coal meters. 56 pp. Republic Flow Meters Co.

Motor Generators. Illustrated bulletin giving good detailed description of this equipment and some of its many applications. Ridgway Dynamo & Engine Co.

Nuchar. Bulletin entitled "Industrial Application of Activated Carbons" gives interesting information on subject of decolorizing, deodorizing, and purifying various industrial products with "Nuchar" carbons. 15 pp. Industrial Chemical Co. Published by same company "Activated Carbons in the Oil Refining Industry."

Pebble Mills. Catalog entitled "Paterson Pebble Mills," gives good description and ilustrations of pebble mills for dry and wet grinding of an endless variety of industrial materials. 20 pp. Paterson Foundry & Machine Co.

Portable Elevators. Illustrated, and describes portable elevators, "Liftruks" and barrel racks, both hand and power operated. Gives dimensions and other useful information. 28 pp. Revolvator Co.

Pressure Fans. Four-page bulletin giving good illustration and description of fans for ventilation. De Bothezat Impeller Co.

Projecting Apparatus. Four page bulletin, "Profile Drawing and Projecting Apparatus," gives descriptions, illustration, applications, and prices of this equipment. E. Leitz. Inc.

Pulverizers. Twenty-four page bulletin giving description and illustrations of American Ring Pulverizers for crushing coal, steel turnings and a variety of industrial bulk materials. "It Crushes Everything." American Pulverizer Co.

Recording Instruments. Illustrated, gives details of construction and good information on application of recording thermometers, vacuum and pressure gages for a variety of industrial uses. 104 pp. C. J. Tagliabue Mfg. Co.

Sanitation. Attractive bulletin entitled "Progress" gives interesting information and illustrations of various municipal water purification plants, sewerage and garbage disposal plants. 32 pp. Sanitation Corporation.

Zirconium Oxide. For the Ceramic and other industries. Bulletin entitled "Tam Opax," Zirconium compound. 23 pp. Titanium Alloy Mfg. Co.

"The Superintendent," issued by Karl Kiefer Machine Co., Cincinnati, bottling machinery, makes suggestions on filtration in the January number.

"Eastman Organic Chemicals, List No. 16. January, 1927" has just been sent to the trade.

One hundred uses for second hand pipe are listed in the January issue of "Oxy-Acetylene Tips for the Linde Oxywelder,' which is 122 pages and illustrated.

Specifications and Formulas for Non-Ferrous Metals," prepared by Society of Automotive Engineers, is being distributed by Niagara Falls Smelting & Refining Corp. In 16-page pamphlet 68 formulas give the composition of as many alloys of bronze, aluminum, brass and other metals.

"Feldspar; Its Origin and Uses, Mines and Mills," is a 34-page pamphlet published by Golding Sons' Co., Erwin Feldspar Co., Clinchfield Products Corp. The part it plays in sanitary, electrical, chemical, and medical fields receives special attention.

"Constant-Potential Arc Welding Sets" is the title of a four-page trade announcement by General Electric Co.

Lockwood, Greene & Co.'s "Engineer" describes its appraisal service, and tells how the company solved the problem of keeping the temperature uniform in Rollins Hosiery Mills, Des Moines, Ia.

CHEMICALS AS ANAYLYSED AT GENEVA

(Continued from page 698)

tained in order to provide a basis for bargaining in commercial treaty negotiations. Such import prohibitions, for example, are still numerous in Czechoslovakia.

The German import regulations which were imposed for the period of transition lapsed on October 1st, 1925.

To the class of import prohibitions which have a mainly commercial character also belong the import prohibitions decreed by Poland against Germany, and those decreed as reprisals by Germany against Poland.

The majority of the remaining import prohibitions have a marked protectionist character. In the chemical industry, aniline dyes are the most affected. Great Britain refuses import licenses for aniline dyes and by-products which are produced in her own territory, irrespective of the origin of the goods. Spain has also recently adopted an import prohibition on aniline dyes, although she apparently intends later to exempt products not manufactured in Spain from the system of licenses. Japan has introduced the license system in respect of aniline dyes and by-products which do not come from countries with which she has concluded a commercial treaty. If not in theory, at least in practice these measures are directed almost exclusively against Germany, as France makes the importation of aniline dyes, by-products, pharmaceutical products and certain other chemicals dependent on licenses, only in the case of those of German origin.

The Chemical Industry as a Whole.

With regard to exports and imports of chemical products, the official foreign trade statistics of the different countries are available. The figures they contain cannot, however, be employed as they stand, for the scope of the term "chemical products" varies considerably. If we take as a basis the definition of the chemical industry given above and classify the individual items of the official trade statistics accordingly when the heading "chemical products" does not correspond to this definition, we obtain the following tables. Conversion into gold marks has been effected on the basis of the average rates for the year.

Value of Exports of Chemical Products

	1913		1924		1925	
	Mill'ns of gold marks	Per'tge of total exports	Milli'ns of gold marks	Per'tge of total exports	Mill'ns of gold marks	Per'tge of total exports
Germany	910	28.4	610	17	930	23
United States .	310	10	570	15.8	650	16
Great Britain .	500	15.6	530	14.7	550	13.6
France	310	9.7	590	16.4	540	13.3
Chile (saltpet.)	470	14.6	450	12.5	(450)	11.1
Italy	65	2	130	3.6	170	4.2
Belgium	180	5.6	(175)	4.9	175	4.3
Netherlands ..	180	5.6	125	3.5	140	3.5
Switzerland ..	60	1.9	110	3.1	130	3.2
Aus. Hungary.	90	2.8	—	—	—	—
Hungary	—	—	10	0.3	5	0.1
Czechoslov. ...	—	—	45	1.25	50	1.3
Austria	—	—	40	1.1	40	1
Poland	—	—	20	0.5	15	0.4
Sweden	30	0.9	70	1.9	70	1.7
Norway	40	1.2	45	1.25	(45)	1.1
Japan	55	1.7	80	2.2	90	2.2
Total ...	3,200	100	3,600	100	4,050	100

The total export figures do not correspond to the total import figures because a number of countries are not included in the tables, and, above all, because the method

Value of Imports of Chemical Products

	1913		1924		1925	
	Mill'ns of gold marks	Per'tge of total imports	Milli'ns of gold marks	Per'tge of total imports	Mill'ns of gold marks	Per'tge of total imports
Germany	490	17.7	160	5.8	240	7.8
United States .	520	18.8	580	20.9	700	22.8
Great Britain .	290	10.5	310	11.2	340	11.1
France	250	9.1	290	10.5	270	8.8
Italy	130	4.7	120	4.3	140	4.6
Belgium	180	6.5	(140)	5.0	140	4.5
Netherlands ..	250	9.1	160	5.8	180	5.9
Switzerland ..	50	1.8	90	3.2	90	2.9
Aus.-Hungary .	120	4.3	—	—	—	—
Hungary	—	—	30	1.1	25	0.8
Czechoslov. ...	—	—	90	3.2	100	3.3
Austria	—	—	50	1.8	45	1.5
Poland	—	—	50	1.8	50	1.6
Russia	160	5.8	45	1.6	100	3.2
Sweden	35	1.3	65	2.3	70	2.3
Norway	20	0.7	25	0.9	(25)	0.8
China	100	3.6	210	7.6	(210)	6.8
Japan	100	3.6	220	8.0	200	6.5
India	70	2.5	140	5.0	150	4.8
Total ...	2,765	100	2,775	100	3,075	100

of estimating the value of the goods on which the official figures of the different countries are based varies considerably.

A closer consideration of the export figures shows that, in 1913, chemical products to the value of 3.2 milliards of gold marks crossed the frontiers in 1913, while in 1925 the figure was 4 milliards. This increase more or less corresponds to the depreciation in the value of gold. *The total volume of the international trade in chemical products has therefore not materially changed.* The increase in the value of the production itself is greater than the depreciation in gold.

If we compare the total export values with the total production values of separate years, we find that, in 1913, out of a production of approximately 10 milliards of gold marks, 3.2 milliards or 32 per cent were exported, while in 1924, out of a production of 18 milliards of gold marks, 3.6 milliards or only 20 per cent was exported. Therefore, in the world as a whole, the home markets have absorbed a greater proportion of the production, while the proportion of exports has fallen.

Prices

If it is desired to obtain some idea of the movement of prices in the different chemical industries of the world, the best method which can be employed, owing to the multiplicity of chemical products, is that of index numbers. Index numbers are given for the four countries most important in the chemical industry, the calculation being that of a private German organisation. The method is as follows:

The basis adopted is the movement of prices of caustic soda, caustic potash, calcium chloride, chloride of lime, citric acid, cream of tartar, acetic acid, yellow prussiate of potassium, sodium sulphate, potassium nitrate, copper sulphate, lithopon, sodium bicarbonate, sodium bichromate, oxalic acid, potash, salammoniac, nitric acid, sulphuric acid and tartaric acid.

For Germany, the selling prices of the chief producing firms were taken. For Great Britain, France and America, the prices given in the trade publication of the countries were taken. The prices were then converted into dollars at the New York rate, the prices for 1913 put at 100 and a special index number calculated for each product and each of the periods chosen. The arithmetic mean of these index numbers was then taken for each of the periods and each of the products considered. Fluctuations in the rate of exchange were thus eliminated and all the figures are on a dollar basis. The details of this calculation cannot be given here for lack of space, but are available if desired. The results are shown in the following table:

Price Index Number in Gold for Chemicals

Period	Germany	Gt. Britain	France	U. S.
1914	100	100	100	100
1924: July	124	140	106	134
August	120	141	116	133
September .	118	139	111	133
October ...	117	138	110	132
November ..	118	142	110	132
December ..	118	146	113	134
1925: January	119	147	113	135
February ..	121	147	116	135
March	122	149	110	135
April	122	146	109	135
May	122	146	110	135
June	122	148	101	135
July	123	148	101	135
August	122	148	102	134
September .	122	146	104	134
October ...	123	145	100	134
November .	123	143	95	134
December .	122	144	93	134
1926: January	120	143	94	134
February ..	120	142	93	133
March	121	141	96	133
April	121	140	93	132
May	121	140	91	132
June	121	141	87	132

General Survey By British Chemical Mfrs. Assn.

The figures quoted in the German monograph require careful examination, and it would be an advantage if the method by which they are calculated could be stated. It is not clear how a figure for the total value of the chemical production of the world has been obtained. Moreover, since there is no general agreement as to what is to be included in the term "chemical products," no accurate figures can be presented for the total world production, and only an intelligent guess can be made at the relative positions of some of the countries.

It might also be pointed out in any general survey of the position of chemical industry that its trend is once more changing. In its earlier stages about a century ago it commenced with the production of what are termed "heavy chemicals," they were few in number and were required in quantities which were large. Later came a period when the industry commenced to produce a vast number of new substances in comparatively small quantities. In this category are included all the synthetic organic dyestuffs and the large range of fine chemicals. At the present time development is on other lines. The synthetic production of chemicals required in large quantities is now being seriously undertaken, as for example the production of artificial silk, ammonia from atmospheric nitrogen, urea, methanol, etc.

In the ultimate analysis it will be found that coal is the real final cheap raw material and that the countries possessing ample supplies of the right kind of coal for use in their chemical industries will be in an advantageous position.

For this reason it is perhaps necessary to give some consideration to the branch of the industry which deals with the distillation of coal tar, although in the strictest sense it may not be considered a chemical industry, because its processes are almost entirely confined to separating from one another, in a more or less high degree of purity, constituents which already exist in its raw material.

The essential factor in the tar distillation industry is that being based on a by-product the quantity of raw material available is fixed together independently of the needs of commerce. It cannot economically be increased or reduced.

Products employed in Agriculture.

It is now generally recognized by scientific authorities that, in view of the imminent cessation of extensive cultivation all over the world and the rapid increase in the total population, a serious shortage in the food supply is bound to occur unless given areas of agricultural land can be made to yield much larger crops than have hitherto been obtained, or unless the nourishment required by man can be supplied by the direct synthesis of his essential foods.

While many different factors enter into the solution of the food problem, it is clear that a more intensive use of fertilisers offers the most immediate prospect of bringing about an increase in crop yields, and it, therefore, seems safe to predict that during the next few years, at any rate, attention will be mainly concentrated on chemical fertilisers.

One of the principles is that, generally speaking, introgen is the most important factor among the plant foods in promoting an increase in crop yield. At the same time, nitrogen has been and still is by far the costliest of the plant foods, the ratio per unit of plant food being about 11 for nitrogen; 2.74 for potash; 2.22 for phosphoric acid.

The effect of this price relation has been to limit the use of nitrogen in the form of fertiliser to a comparatively small portion of the cultivated surface of the globe, its use at past and present prices being only economically justifiable on a comparatively small range of high-priced crops.

In spite of this artificial limitation placed on the development of potential markets, the necessity of replacing a portion of the enormous quantity of nitrogen removed from the soil in the crop (estimated by Dr. J. Lipmann, New Jersey, at over 20,000,000 tons of pure nitrogen per annum for the United States of America alone) has been so imperious that the world's output of nitrogen has had to be increased from about 770,000 tons in 1913-14 to 1,245,000 tons in 1925-26. The proportional rate of increase in agricultural consumption during the last few years has been almost double the rate at the beginning of this decade, and is now approaching 10 per cent, per annum.

If this rate of progress is maintained, the demand for nitrogen will have far outstripped the present combined producing capacity of Chilean synthetic and by-product nitrogen works within the next four years. If, therefore, it is urged that, in view of the plans for creating and extending synthetic nitrogen production, which are now in active preparation practically throughout Europe and also

in Russia, Japan and the New World, the industry is approaching a condition of over-production, it may with justice be contended that, until the effect on the demand of a substantial reduction in price has been ascertained, it is not permissible to claim that the productive capacity existing and in preparation is even adequate far less excessive.

The sustained strength of the demand during the last ten years has resulted in selling prices for nitrogen which have borne little or no relation to cost of production either in Chile or at by-product or synthetic works. This state of affairs has had a two-fold influence on the manufacturing side of the industry.

On the one hand, it has caused private capital to flow generously into a seemingly attractive proposition, and on the other hand it has stimulated direct or indirect incursion into the industry by the State in several countries (Great Britain *not* being one of these), in the hope of meeting the chronic clamour of the farmers for lower prices of nitrogen and reducing importation of food, and at the same time of providing an insurance against future unpreparedness for war or possibly against the prospect of a more distant world shortage of food. The problem for the States which are suffering from a depreciated currency, and which are not in a specially favoured economic position for producing synthetic nitrogen, is whether the ultimate capital loss likely to be experienced on the erection and maintenance of the plant can be regarded as profitably offset by the immediate alleviation of budgetary difficulties to be secured by the production of more food at home and importation of less from abroad.

State activity of this kind, especially when bolstered up by a high tariff, is, no doubt, regrettable from a purely economic point of view, but it is impossible not to sympathise with the desire of even small countries to render themselves partially or wholly independent as regards the supply of so vital a necessity as nitrogen.

A further argument advanced against the diffusion of synthetic nitrogen works is the fact that within the limits of present technical achievement production at the lowest cost only appears to be possible if operations are conducted on a gigantic scale; this carries with it the risk of a sudden large shortage of supply in case of accident, and also raises problems in regard to transport and distribution.

A further difficulty arises owing to the fact that only recently have successful attempts been made to supply nitrogen in the form most suitable for the particular type of plant and soil to be manured. It is certain that the industry has as yet only touched the fringe of this problem. Its successful solution will certainly open up new avenues of demand which have been closed to the somewhat Procrus-

tean methods of propaganda hitherto carried on in favour of fertilisers like Chile nitrate and ammonium sulphate.

The desire to protect the enormous capital already sunk in the large synthetic works and the politico-economical reasons for the fostering of smaller works by some States, referred to above, are each of such a cogent nature that nothing short of an actual trial of strength in regard to selling prices is likely to settle the final aspect which the industry is to assume.

Signs are not wanting that this trial of strength cannot now be long delayed. It is at present impossible to say whether an equilibrium between supply and demand will be reached at a level of price which will permit an economic functioning of synthetic plant under the less favourable economic conditions, or whether it will be necessary to seek a level at which only the largest scale synthetic producers can "live."

When this question has been settled, not on paper but in practice, it will be possible to state what special steps (if any) are necessary to ensure adequate supplies of nitrogen to countries which cannot produce it economically.

In the meantime the Economic Conference may be able to prevent much unprofitable expenditure of capital, both private and public, by pointing out that a heavy reduction in the selling price of nitrogen is inevitable in the near future if agricultural requirements are to be met.

In conclusion it is urged that no attempt should be made at present to regulate the nitrogen industry by inter-State Agreements. Both the scientific and economic bases for any such regulation are lacking. As soon as equilibrium on a new price-level is attained, the chief nitrogen producing groups in the world will be able to meet and take suitable steps for the further development of the industry.

Heavy Chemicals.

By way of comment it is suggested that sufficient importance is not attached in the German monograph to the position of the Alkali industry.

The world consumption of alkali is continually expanding and Great Britain's production continues to grow notwithstanding that several countries, which formerly imported, have not only become self-supplied but are now developing an export trade, and also that the product produced by chemical reaction has had to meet material competition from natural deposits such as Magadi Soda.

The growth of population and the advance of civilisation in foreign regions account for much of the expansion; at the same time it must not be forgotten that very material progress is due to technical developments, the introduction of new commodities, and the extension of the field of usefulness of older products. Illustrations of this may be found in the increasing use of Soda Ash (replacing Saltcake) in glass manufacture, the birth and growth of Viscose Silk, and the later uses and possibilities of Sodium Silicate as an adhesive and in road-making.

Development of Technique.

An agreement may be expressed in general terms with the views set forth in the German monograph, but certain

of the points made require emphasis and others might be elaborated.

The foundation of Chemical Industry is research, pursued for the discovery of new products, improvements in manufacturing processes, and utilisation of by-products. Where an army of research workers is constantly contributing to scientific and technical knowledge it is inevitable that the industry in which they operate should gradually and continuously expand its scope. During the 70 years of its life, the aniline dye industry has abundantly demonstrated this. It is the parent of the synthetic perfumes, pharmaceutical products, photographic chemicals and even of the synthetic ammonia and methanol industries.

It is, therefore, self-evident that the manufacture of aniline dyes is of first importance not only of itself but also by virtue of its potentiality as a research centre. Nowhere else in industry is such a variety of scope and opportunity presented for the trained chemist. On the other hand, no other industry offers like facilities for the training of the post-graduate chemist.

It has become an axiom that the future of the chemical industry largely depends upon its ability to maintain and develop its technical and scientific sides. Probably it is not an exaggeration to say that the dependence is upon the ability of the aniline dye industry to do so. Such a view would find support in the very striking examples of chemical industrial achievements typified in the synthesis of ammonia and of methanol by the application of the principle of high pressure catalytic reaction of gases worked out as a side line by the dyestuffs industry.

Too much emphasis cannot be laid on the enormous expenditure involved in chemical industry in the early stages of development in new processes and more especially in proving their usefulness in their varied applications. Even then the country in which the early discoveries are made may not reap the benefit. Perkin's discovery in England of Mauvein was the foundation of the synthetic organic dyestuffs industry, but the industry was first fully developed in Germany, and finally Germany was responsible for producing nearly 90 per cent. of the world's requirements. This example is used in the German monograph to show that "this concentration in a single country was of decisive importance for the development of this industry into a remunerative large-scale industry." The argument is not conclusive, first because the Swiss dyestuffs industry which grew up side by side with the German industry was (although much smaller) remunerative, and secondly, it does not necessarily apply to other industries. It cannot be contended, for example, that because in England and America as well as in Germany there are synthetic ammonia industries none can succeed because the work is not concentrated in one country.

It probably is only sound when applied to goods of which the money value per unit of weight is high. Moreover, a contemplation of the 1,500 different dyestuffs which have been produced in Germany may lead to an erroneous value being given to the argument which has been adduced. It seems to be contended that such a number was necessary, or if not necessary at least desirable, as contributing in some way to the benefit of the colour-using industries. This may be doubted.

It must be remembered that prior to 1914 the German dyestuffs industry consisted of nine firms of major importance and a few smaller firms, all engaged in vigorous competition with each other. There was, therefore, not the concentration of technique and manufacture in Germany which the German monograph appears to suggest. The output of the major firms averaged less than 15,000 tons, the individual output probably varying from 3,000 to 25,000 tons per annum. All the firms were prosperous and secured a remunerative return on their capital. There seems to be no reason, therefore, why a firm carrying on

business on a similar scale in other countries of the world should not have been equally successful provided it had at its disposal the same degree of technical skill.

It should be noted that the vigorous competition between the German dyestuffs firms was the chief reason which led to the multiplication of types of dyestuffs sold. The number is placed in the German monograph at 1,500, but this number could be, and will in time undoubtedly be, considerably reduced with advantage both to the maker and to the consumer. It could be reduced probably by more than one half.

On these grounds, therefore, the British view-point differs a little from that of our German associates. Nor can the views expressed in the German monograph on the steps which have been taken to build up and maintain dyestuffs industries in various countries be accepted in their entirety. It is admitted that to concentrate the industry in one country has certain advantages in fostering its development and very material advantages to the country itself. But the dyestuffs industry is in a very special position for two reasons:

(1) On it is dependent the, commercially, infinitely greater textile industry, and

(2) It provides a magnificent training ground for young chemists.

It was, therefore, essential for Britain, in common with other countries, to provide herself with an industry which was of such importance to her national welfare. It is true, as stated in the German monograph, that "the market of each individual industry can, therefore, be only a fraction of the market which Germany monopolised before the war," and that "the consequence is that there is now in each of these industries a thoroughly unsound ratio between overhead costs and current costs of production (expenditure on raw materials, power and wages)." The monograph then continues :"Consequently, in none of the new producing countries have the younger industries been able to develop and maintain themselves out of their own resources. Not only has it been necessary in many countries to spend public money on their maintenance, but the whole market has had to be protected by high customs barriers, and in some cases import prohibitions have been required to regulate and restrict artificially the influx of foreign dyestuffs."

On this certain comments must be made. First, the various countries were compelled to establish these industries by the failure of the supplies of German dyes at the outbreak of war in 1914. Secondly, it is not an unusual thing for an industry to have to adjust itself to a lessened demand for its products; it is unpleasant, it takes time, but it is done. Thirdly, the production of dyestuffs is only a branch of chemical industry, and it can so be linked with other branches as to mitigate the financial hardship involved in reconstruction. Fourthly, it should be recognised that other countries cannot be expected to do in ten years what Germany has had fifty years to accomplish. Lastly, the reference which is made to the assistance which other countries have received by way of public money, high customs barriers, and import prohibitions is incomplete. In the development of her industry over the fifty years referred to above, Germany has not been entirely without the support and assistance of her Government.

Non-Economic Factors.

Nor can any exception be taken to the statement of fact that of recent years there has been a tendency among the countries to develop chemical industries within their borders for the purpose of making themselves as economically in-

dependent as possible. Although it is nowhere so stated, this appears to be regretted by the writers of the German monograph. Reference is again made to the State assistance given in the form of tariffs, prohibitions and "even money subsidies." Preference is apparently given to the system whereby each country makes what it is best fitted to make and exchanges these goods for others made in the countries most naturally equipped for making them. The system is theoretically ideally perfect, but unfortunately is difficult to carry out in practice.

National independence is a strong factor to which great importance will continue to be attached on purely economic grounds, for the reason that very many trades are dependent in an ever-increasing degree upon synthetic products.

This need for independence in regard to dyestuffs and fine chemical production is all the greater because there have been in the past instances in which a country considered it could keep the method of production secret to compel other importing countries to pay exorbitant prices for the commodity. The production of fine chemicals has in the past lent itself well to secrecy, and secrecy has consequently been a strong factor in the situation.

Two methods employed in dealing with new knowledge in the case of fine chemicals may be illustrated by examples. Insulin was introduced to the world under the control of a patent held by Toronto University, in which the inventors worked. This University definitely set out to give to the world the knowledge of the method of preparation, and worked to this end to the full extent of its power. It also sought the assistance of the British Medical Research Council, who materially helped the same objects. As a result, insulin rapidly became cheaply available throughout the world, and its production was greatest in those countries best fitted for the purpose. In consequence, the treatment of diabetes has been revolutionised all over the world.

As an example of another method, reference may be made to Bayer 205, the symmetrical urea introduced as a cure for tropical diseases due to trypandsomes by the Bayer Co., of Germany. This was put upon the market without its composition and method of manufacture becoming known, presumably in order that it might be retained in German hands. No patent was taken out for the final product, although the avenues of approach were protected by numerous patents. The knowledge of the usefulness of this product therefore has developed very slowly. If it proves, as the inventors hope, an agent of great benefit to the world in combating disease, the country of origin, if it successfully retains its secret, would also retain its complete control over the production, distribution and price of the product..

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The Chemical Market-place

[Spot Stocks Department]

California

Illinois

Local Market Conditions

CHICAGO

General business conditions in the Chicago territory are improving at the moment, while chemical conditions might best be characterized as only fair. Included in and the most noteworthy of the active items are glycerin, naphthalene vanillan and zinc oxide which are all in some demand and firm. Price advances in alcohol, tartaric and citric acids in line with the up ward turn throughout the country have been the only changes worthy of comment since the last report. Alcohol is particularly firm. Collections in this territory are fair.

BOSTON

Both chemical and general business conditions in the Boston territory are characterized as fair during the past month. Denatured alcohol and solvents as is the case in most centers have been the most active items with alcohol firm and advancing. The consuming demand for heavy chemicals has been quite routine and as a result the market is not very active. Collections in this territory are slow.

KANSAS CITY

Business conditions in the Kansas City territory have been somewhat affected by the unusual weather conditions and excessive rains but on an average business is holding up well as compared with 1926 and in some instances is ahead.

Considerable interest is being displayed in denatured alcohol and buyers are anxious to get their Fall requirements covered, and are freely entering the market with sellers not disposed to commit themselves. There is keener competition and concessions in many chemical lines where the prices are more or less routine are being noted. Manufacturers are pressing generally for business.

Warehouses in St. Louis along the river-front were generally flooded during the high water and this was a common occurence in all branches located on the water-front.

Collections are slow and buying is mostly from hand to mouth.

Massachusetts

Michigan

Missouri

[The Chemical Market - place Spot Stocks Department]

Missouri--(cont.)

New Jersey

New York

Local Market Conditions

ST. LOUIS

Business conditions in general in the St. Louis district are fair at the moment with chemical conditions reported as good. This cannot be said of the territory just South of this city where the flood has had a bad effect on business. Chloride of lime has become active and is in unusual demand owing to the flood. Otherwise fertilizer chemicals are most active at this writing. A decline in the price of lead oxide by ½c lb. is the most notable price change of the period under review. Collections are fair.

BUFFALO

General industrial business has been active and improving of late. Improvement also noted in paint industry. Buyers are interested in shellac, turpentine and rosin, also increased interest being shown on alcohol. Little improvement shown in collections.

CLEVELAND

General business in this territory has strengthened considerably and the outlook is more or less favorable than it was a month ago. The paint business seems to be opening up very well in the Cleveland territory and most of the manufacturers are running full time. The Linseed Oil market has been quite active since April 25th, due, undoubtedly, to the advance in the seed market. There has just been an advance in this market—Linseed Oil being quoted at 10.4 May/June and 10.5 for July/December. Alcohol has advanced 2½c per gallon with very little demand from the buyers. Glycerin remains at 26c, which is about the same level that it has been for some time. April 1st Benzol went up 1c per gallon and is now being quoted at 30c per gallon in tank wagons. Toluol has been more or less scarce and quite active. It is now quoted at 44c in tank wagon. Butyl Acetate is being quoted at $1.50 Cleveland in tank cars which shows an advance of about 5c a gallon over the past month.

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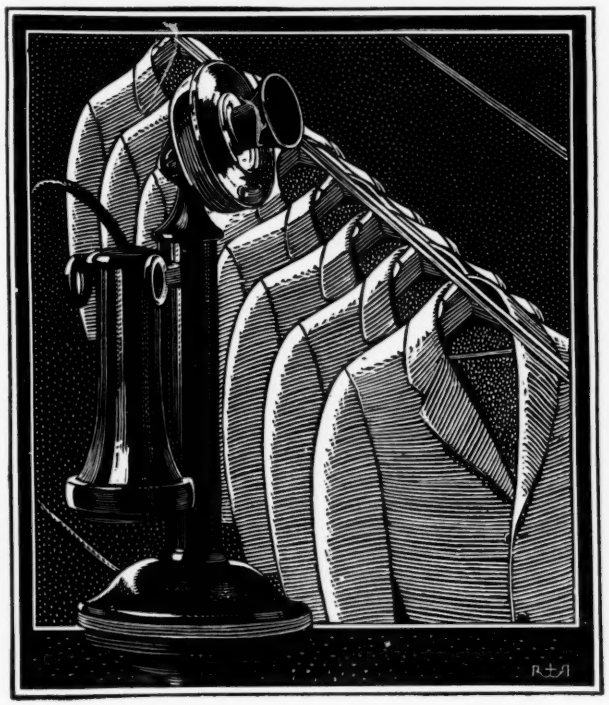
Why not call them up *Long Distance* order more



A MADISON, WISCONSIN, clothier found that he was having a run on a special suit of collegiate type. He called the Chicago manufacturer on Thursday morning. Eight suits arrived on Friday. The entire lot was disposed of Saturday. "Had it not been for the telephone," he writes, "we would not have been able to satisfy the demand for a week-end business so profitable to us."

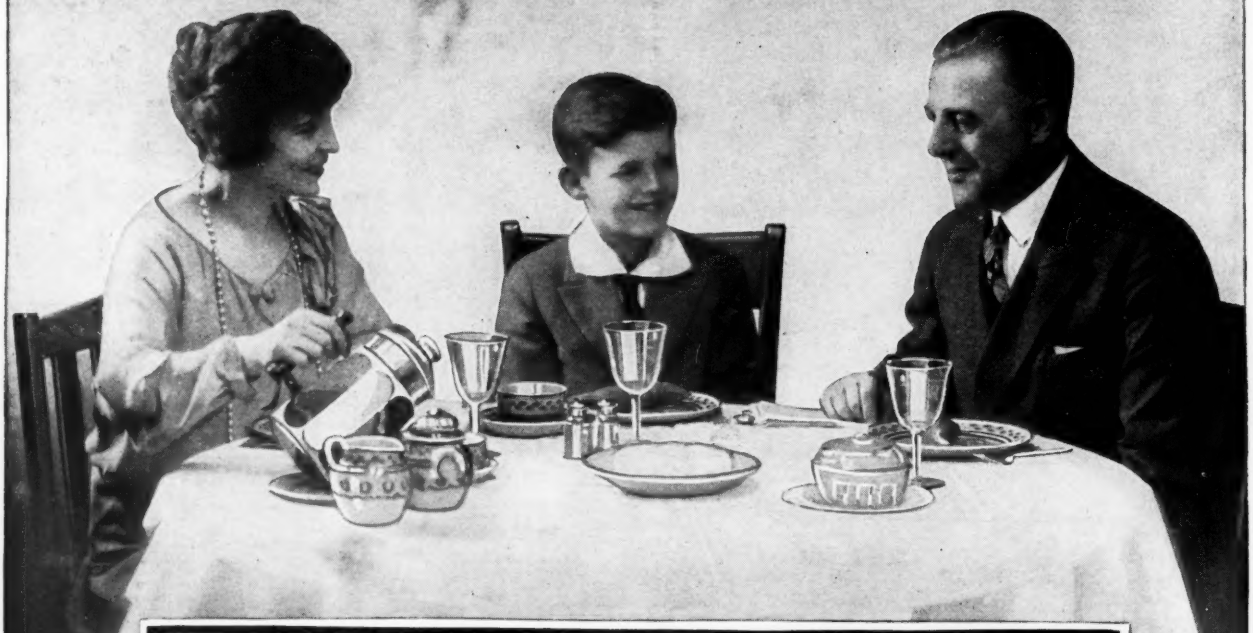
FROM ALL PARTS of the country comes similar news. From Wheeling, West Virginia: "A tremendous demand for slickers caused us to save many sales that would have been lost, had we not used the long distance telephone to secure immediate shipments." Louisville, Kentucky: "We use Long Distance for making purchases . . . for hurrying along information and shipments. . . . In many cases it has saved us trips to market." Rochelle, Illinois: ". . . not a week goes by but we use Long Distance to take care of rush orders. . . . The only satisfactory way." Cincinnati: "Long Distance in our case is just as important as the local telephone."

There's scarcely a business in this country that could not use long distance calls to cut costs, save trips and get needed goods. They'll nearly always cost less than you think. . . . *Number, please?*

BELL LONG DISTANCE SERVICE

R&H
REG. U.S. PAT. OFF.
CHEMICALS AND SERVICE

— play a vital part in the daily life of JOHN DOE



As John unfolds his breakfast napkin he appreciates its snowy whiteness, rivaling that of the table cloth and the collar he is wearing; the table linen may have been laundered with washing powder containing R & H Sodium Perborate, and the collar is Solozone-bleached perhaps. John's woolen suit was prepared and dyed with the aid of Caustic Potash, Carbonate of Potash, Glauber's Salt, Formic Acid, Oxalic Acid and Formaldehyde.

He sips his orange juice unrealizing that the trees which bore the fruit were fumigated with Hydrocyanic gas and his cereal insured against grain smut by PAC Formaldehyde.

Into the making of the china went Feldspar, Clays, Silica, Tin Oxide, Fluorspar and Zinc Oxide; it is decorated with Liquid Bright Gold and R & H Ceramic Colors. The tableware is resplendent, having been silver plated with Silver Cyanide and Cyanegg.

Breakfast finished, John lifts his glass fabricated with Cobalt Oxide, Manganese Oxide, Carbonate of Potash Hydrated and Feldspar, and takes a drink of water carefully treated with Chlorine. Possibly the ice cubes were made in an Artic (Methyl Chloride) household refrigeration machine.

(John is next seen en route to his office)

The
ROESSLER & HASSLACHER CHEMICAL CO.
709 Sixth Avenue, New York